Spec Sheet

Cisco UCS B22 M3 Blade Server

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OVERVIEW

The Cisco® UCS B22 M3 Blade Server delivers a balanced price/performance feature set to address quick deployment of scalable IT infrastructure and Web 2.0 applications. The Cisco UCS B22 M3 harnesses the power of the latest latest Intel® Xeon® E5-2400 v2 and E5-2400 series processor family CPUs with expandability to 384 GB of RAM (using 32 GB DIMMs), 2 hot-plug drives, and 2 PCIe mezzanine adapter slots for up to 80 Gbps throughput.

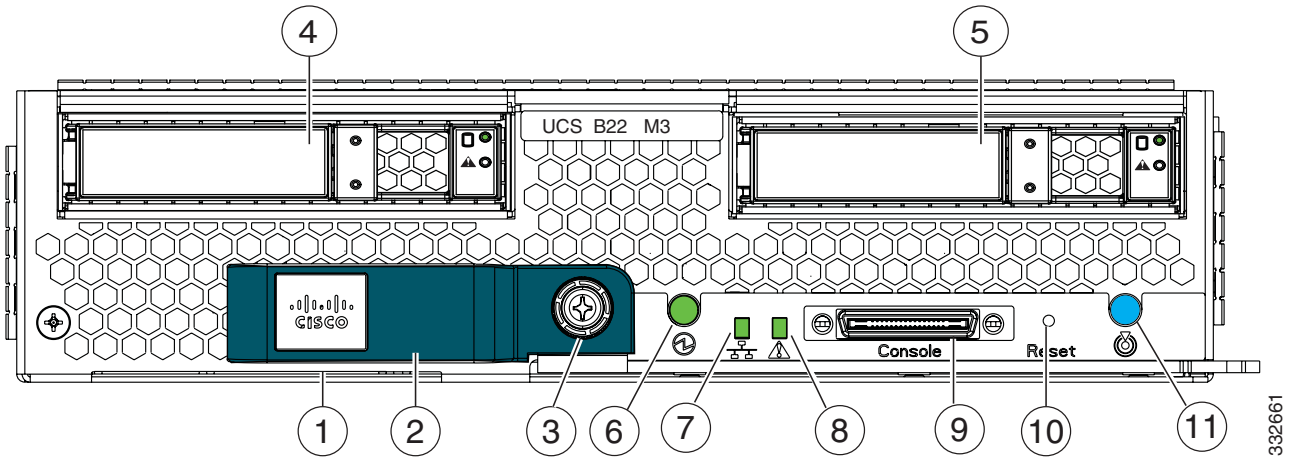
Figure 1 Cisco UCS B22 M3 Blade Server

DETAILED VIEWS

Blade Server Front View

Figure 2 is a detailed front view of the Cisco UCS B22 M3 Blade Server.

Figure 2 Blade Server Front View



1	Asset pull handle (a blank asset tag is provided on which you can add your own label or sticker or you can use a marker to write your asset information on the tag)	**7**	Network link status LED
2	Blade ejector handle	**8**	Blade health LED
3	Ejector captive screw	**9**	Console connector[1]
4	Drive bay 1	**10**	Reset button access
5	Drive bay 2	**11**	Beaconing LED and button
6	Power button and LED	**—**	—

Notes

1. For information about the KVM local I/O cable that plugs into the console connector (a cable is included with every Cisco UCS 5100 Series blade server chassis accessory kit), see *ORDER OPTIONAL KVM LOCAL I/O CABLE* on page 32*.

BASE SERVER STANDARD CAPABILITIES and FEATURES

Table 1 lists the capabilities and features of the base server. Details about how to configure the server for a particular feature or capability (for example, number of processors, disk drives, or amount of memory) are provided in *CONFIGURING the SERVER on page 7*.

Table 1 Capabilities and Features

Capability/Feature	Description
Chassis	The UCS B22 M3 Blade Server mounts in a Cisco UCS 5100 series blade server chassis
CPU	One or two Intel® E5-2400 v2 or E5-2400 series processor family CPUs
Chipset	Intel® C600 series chipset
Memory	12 total slots for registered ECC DIMMs for up to 384 GB total memory capacity (using 32 GB DIMMs)
I/O	Mezzanine adapters: ■ Adapter slot 1 for Cisco's VIC 1240 adapter, which provides Ethernet and Fibre Channel over Ethernet (FCoE) ■ Adapter slot 2 for various types of Cisco, Emulex, or QLogic network I/O adapters or Cisco UCS Storage Accelerator adapters **NOTE:** Adapter slot 2 is supported only for 2-CPU system configurations.
Storage controller	LSI Logic SAS 2002 integrated controller ■ 6 Gbs SAS/SATA support ■ RAID 0 and 1 **NOTE:** The integrated RAID controller does not implement a write cache. However, servers that implement two HDDs and RAID controllers with cache lack the ability to match the performance of RAID'ed SSDs without cache, as implemented in this server.
Internal storage devices	Up to two optional, front-accessible, hot-swappable 2.5-inch small form factor (SFF) SAS or SATA solid-state disks (SSDs) or hard disk drives (HDDs). An internal USB 2.0 port is also supported. A 4 GB USB 2.0 device is available from Cisco.

Table 1 Capabilities and Features *(continued)*

Capability/Feature	Description
Video	The Emulex Pilot 3 Integrated Baseboard Management Controller provides video: ■ Matrox G200e video controller ■ Integrated 2D graphics core with hardware acceleration ■ Supports all display resolutions up to 1920 x 1200 x 16 bpp resolution at 60 Hz ■ 24-bit color depth for all resolutions less than 1600x1200 ■ 8 MB video memory
Interfaces	■ Front panel • One console connector (see ***ORDER OPTIONAL KVM LOCAL I/O CABLE* on page 32***)
Power subsystem	Integrated in the Cisco UCS 5100 series blade server chassis
Fans	Integrated in the Cisco UCS 5100 series blade server chassis
Integrated management processor	The built-in Cisco Integrated Management Controller (CIMC) GUI or CLI interface enables you to monitor the server inventory, health, and system event logs.
Cisco UCS Diagnostics for Cisco UCS B-Series Blade Servers	The Cisco UCS Blade Server Diagnostics tool for Cisco UCS Blade Servers enables you to verify the health of the hardware components on your servers. The diagnostics tool provides a variety of tests to exercise and stress the various hardware subsystems on the Cisco UCS Blade Servers, such as memory and CPU. You can use the tool to run a sanity check on the state of your Cisco UCS Blade Servers after you fix or replace a hardware component. You can also use this tool to run comprehensive burn-in tests before you deploy a new Cisco UCS Blade Server in your production environment. See the following links for more information: User Guide: ***http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/sw/ucs_diagnostics/b_UCS_Blade_Server_Diagnostics_User_Guide.html*** ISO Download: ***http://www.cisco.com/cisco/software/navigator.html***

CONFIGURING the SERVER

Follow these steps to configure the Cisco UCS B22 M3 Blade Server:

- *STEP 1 VERIFY SERVER SKU, page 8*
- *STEP 2 CHOOSE CPU(S), page 9*
- *STEP 3 CHOOSE MEMORY, page 11*
- *STEP 4 CHOOSE HARD DISK DRIVES or SOLID STATE DRIVES (OPTIONAL), page 14*
- *STEP 5 CHOOSE ADAPTERS, page 16*
- *STEP 6 ORDER A TRUSTED PLATFORM MODULE, page 20*
- *STEP 7 ORDER CISCO FLEXIBLE FLASH SECURE DIGITAL CARDS, page 21*
- *STEP 8 ORDER OPTIONAL INTERNAL USB 2.0 DRIVE, page 22*
- *STEP 9 CHOOSE OPERATING SYSTEM AND VALUE-ADDED SOFTWARE, page 23*
- *STEP 10 CHOOSE OPERATING SYSTEM MEDIA KIT, page 26*
- *STEP 11 CHOOSE SERVICE and SUPPORT LEVEL, page 27*

STEP 1 VERIFY SERVER SKU

Verify the product ID (PID) of the server as shown in ***Table 2***.

Table 2 PID of the Base UCS B22 M3 Blade Server

Product ID (PID)	Description
UCSB-B22-M3	UCS B22 M3 Blade Server without CPU, memory, HDD, VIC 1240 adapter, or mezzanine adapters

The base Cisco UCS B22 M3 blade server does not include the following components. They are to be selected during product ordering:

- CPU(s)
- Memory
- Disk drives
- VIC 1240 adapter
- Emulex or QLogic I/O adapters
- Cisco UCS Storage Accelerators

NOTE: Use the steps on the following pages to order the UCS B22 M3 server with the configurable components that you want configured.

STEP 2 CHOOSE CPU(S)

The standard CPU features are:

- Intel Xeon processor E5-2400 v2 or E5-2400 series processor family CPUs
- Intel C600 series chipset
- Cache sizes of up to 25 MB

Select CPUs

The supported Intel Xeon E5-2400 v2 and E5-2400 series family CPUs on the UCS B22 M3 are listed in ***Table 3***.

Table 3 Supported Intel CPUs: E5-2400 v2 and E5-2400 Series Processor Family CPUs

Product ID (PID)	Intel Number	Clock Freq (GHz)	Power (W)	Cache Size (MB)	Cores	QPI	Highest DDR3 DIMM Clock Support (MHz)[1]
Intel Xeon E5-2400 v2							
UCS-CPU-E52470B	E5-2407 v2	2.4	95	25	10	6.4 GT/s	1600
UCS-CPU-E52450B	E5-2450 v2	2.5	95	20	8	7.2 GT/s	1600
UCS-CPU-E52440B	E5-2440 v2	1.90	95	20	8	7.2 GT/s	1600
UCS-CPU-E52430LB	E5-2430L v2	2.40	60	15	6	7.2 GT/s	1600
UCS-CPU-E52420B	E5-2420 v2	2.20	80	15	6	7.2 GT/s	1600
UCS-CPU-E52407B	E5-2407 v2	2.40	80	10	4	6.4 GT/s	1333
UCS-CPU-E52403B	E5-2403 v2	1.80	80	10	4	6.4 GT/s	1333
Intel Xeon E5-2400							
UCS-CPU-E5-2470	E5-2470	2.30	95	20	8	8 GT/s	1600
UCS-CPU-E5-2450	E5-2450	2.10	95	20	8	8 GT/s	1600
UCS-CPU-E5-2440	E5-2440	2.40	95	15	6	7.2 GT/s	1333
UCS-CPU-E5-2430L	E5-2430L	2.00	60	15	6	6.4 GT/s	1333
UCS-CPU-E5-2420	E5-2420	1.90	95	15	6	7.2 GT/s	1333
UCS-CPU-E5-2403	E5-2403	1.80	80	10	4	6.4 GT/s	1066

Notes

1. If higher or lower speed DIMMs are selected than what is shown in the table for a given CPU, the DIMMs will be clocked at the lowest common denominator of CPU clock and DIMM clock. For example:

   Selecting lower-speed DIMMs: If you use an E4-2470 CPU (which can support up to 1600-MHz DIMMs) with 1333-MHz DIMMs, the DIMMs will be clocked at the lower speed of 1333 MHz.

   Selecting higher-speed DIMMs: If you use 1600-MHz DIMMs with an E5-2420 CPU (which can support up to 1333-MHz DIMMs), the DIMMS will be clocked at the lower speed of 1333 MHz.

Supported Configurations

(1) 1-CPU Configuration

- Choose one CPU from any one of the rows of ***Table 3 on page 9***.

(2) Two-CPU Configuration

- Choose two identical CPUs from any one of the rows of ***Table 3 on page 9***.

Caveats

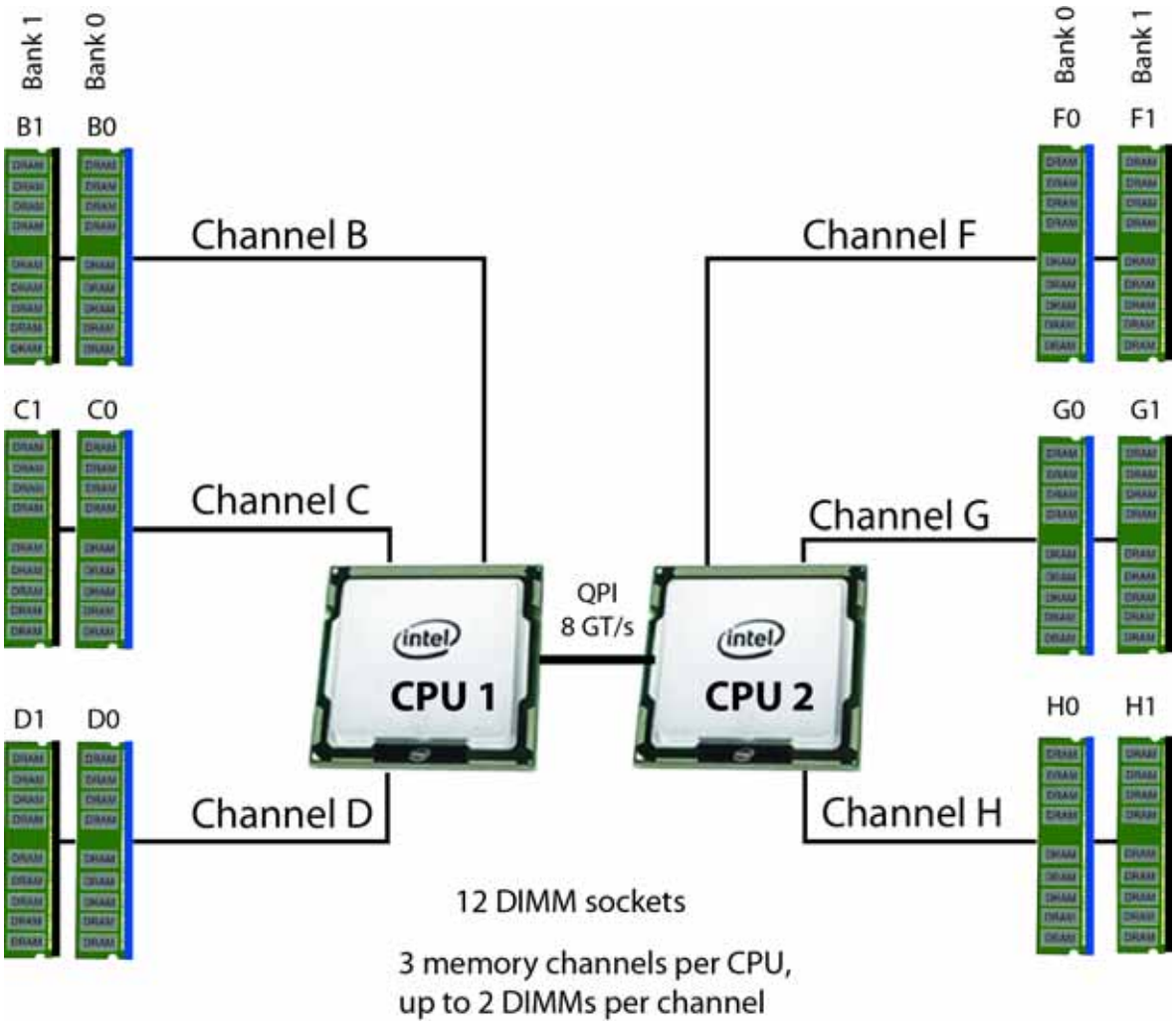
- For optimal performance, select DIMMs with the highest clock speed for a given processor.
- The B22 M3 configured with 1 CPU provides limited network connectivity options. The following restrictions apply:
  - A virtual interface card (VIC), the VIC 1240, must always be installed in the VIC 1240 connector.
  - The connectivity options are:
    - VIC 1240 installed in VIC 1240 slot (adapter 1 slot) and no adapter installed in the mezzanine slot (adapter 2 slot)
- See ***Network Connectivity on page 41*** for complete information on network connectivity support for a B22 M3 configured with 1 CPU or 2 CPUs.
- The VIC 1240 adapter is supported for 1- or 2-CPU configurations.
- Cisco, Emulex, or QLogic I/O adapters or Cisco UCS Storage Accelerators are supported only for 2-CPU configurations.

STEP 3 CHOOSE MEMORY

The standard memory features are:

- DIMMs
  - Clock speed: 1600 MHz
  - Ranks per DIMM: 1 or 2
  - Operational voltage: dual (1.5 or 1.35 V)
  - Registered
- DDR3 ECC registered DIMMs (RDIMMs)
- Memory is organized with three memory channels per CPU, with up to two DIMMs per channel (DPC), as shown in ***Figure 3***. Maximum memory capacity is 384 GB (with 32 GB DIMMs).

Figure 3 UCS B22 M3 Memory Organization



Choose DIMMs and Memory Mirroring

Select the memory configuration and whether or not you want the memory mirroring option. The supported memory DIMMs and the mirroring option are listed in ***Table 4***.

NOTE: When memory mirroring is enabled, the memory subsystem simultaneously writes identical data to two adjacent channels. If a memory read from one of the channels returns incorrect data due to an uncorrectable memory error, the system automatically retrieves the data from the other channel. A transient or soft error in one channel does not affect the mirrored data, and operation continues unless there is a simultaneous error in exactly the same location on a DIMM and its mirrored DIMM. Memory mirroring reduces the amount of memory available to the operating system by 50% because only one of the two populated channels provides data.

The supported memory DIMMs in the UCS B22 M3 are listed in ***Table 4***.

Table 4 Supported DDR3 DIMMs and Memory Mirroring Option

Product ID (PID)	PID Description	Voltage	Ranks /DIMM
DIMM Options			
UCS-ML-1X324RY-A	32GB DDR3-1600-MHz LRDIMM/PC3-12800/4R/x4/1.35v/35nm	1.35	4
UCS-MR-1X162RY-A	16GB DDR3-1600-MHz RDIMM/PC3-12800/2R/x4/1.35v/35nm	1.35/1.5 V	2
UCS-MR-1X082RY-A	8GB DDR3-1600-MHz RDIMM/PC3-12800/2R/x4/1.35v/35nm	1.35/1.5 V	2
UCS-MR-1X041RY-A	4GB DDR3-1600-MHz RDIMM/PC3-12800/1R/x4/1.35v/35nm	1.35/1.5 V	1
Memory Mirroring Option			
N01-MMIRROR	Memory mirroring option		

Supported Configurations

(1) Without memory mirroring:

- Select from 1 to 6 DIMMs per CPU (note that there are 6 DIMM slots per CPU)

(2) With memory mirroring:

- Select 2 or 4 DIMMs per CPU. The DIMMs must be identical across channels for the same banks.The DIMMs will be placed by the factory as shown in ***Table 5***:

Table 5 DIMM Placement With Memory Mirroring

Number of DIMMs per CPU	DIMM Placement in Channels (with memory mirroring implemented). Note that Channels B and F are not used for memory mirroring	
	CPU 1	**CPU 2**
2	1 DIMM in Channel C (C0), 1 DIMM in Channel D (D0)	1 DIMM in Channel G (G0), 1 DIMM in Channel H (H0)
4	2 DIMMs in Channel C (C0, C1), 2 DIMMs in Channel D (D0, D1)	2 DIMMs in Channel G (G0, G1), 2 DIMMs in Channel H (H0. H1)

- Select the memory mirroring option (N01-MMIRROR) as shown in ***Table 4 on page 12***.

NOTE: System performance is optimized when the DIMM type and quantity are equal for both CPUs, and when all channels are filled equally across the CPUs in the server.

Caveats

- For 2-CPU configurations, DIMMs must be even across the server (2, 4, 6 up to 12). For example, you can select four 8 GB DIMMs and six 16 GB DIMMs.
- Memory mirroring reduces the amount of available memory by 50% (quantity of DIMMs must be even for mirroring).
- By default, all DIMMs run at 1.35 V, which yields 1333-MHz memory speeds. To run the memory DIMMS at 1600 MHz, you need to go into the BIOS or set the policy with UCSM (service profile) to run in Performance Mode. This forces the DIMMs to operate at 1.5 V and yields 1600-MHz speeds provided:
  - The DIMMs are 1600-MHz devices
  - The CPUs chosen support 1600-MHz operation

  For more information regarding memory, see ***DIMM and CPU Layout on page 34*** and ***DIMM Population on page 36***.

STEP 4 CHOOSE HARD DISK DRIVES or SOLID STATE DRIVES (OPTIONAL)

The UCS B22 M3 can be ordered with or without drives. The standard disk drive features are:

- 2.5-inch small form factor
- Hot-pluggable sled mounted

NOTE: The UCS B22 M3 blade server meets the external storage target and switch certifications as described in the following link:

http://www.cisco.com/en/US/docs/switches/datacenter/mds9000/interoperability/matrix/Matrix8.html#wp323852

Choose Drives

The supported drives in the UCS B22 M3 are listed in ***Table 6***.

Table 6 Supported Hot-Pluggable Sled-Mounted HDDs and SSDs

Product ID (PID)	PID Description	Drive Type	Capacity
HDDs			
A03-D1TBSATA	1 TB 6 Gb SATA 7.2K RPM SFF HDD	SATA	1 TB
UCS-HDD900GI2F106	900 GB 6Gb SAS 10K RPM SFF HDD	SAS	900 GB
A03-D600GA2	600 GB 6 Gb SAS 10K RPM SFF HDD	SAS	600 GB
A03-D500GC3	500 GB 6 Gb SATA 7.2K RPM SFF HDD	SATA	500 GB
UCS-HDD300GI2F105	300 GB 6 Gb SAS 15K RPM SFF HDD	SAS	300 GB
A03-D300GA2	300 GB 6 Gb SAS 10K RPM SFF HDD	SAS	300 GB
SSDs			
UCS-SD400G0KA2-G	400GB SATA 2.5" Enterprise Value SSD	SATA	400 GB
UCS-SD120GOKS2-EV	120 GB SATA 2.5 inch Enterprise Value 6G SSD	SATA	120 GB
UCS-SD100G0KA2-G	100GB SATA 2.5" Enterprise Value SSD	SATA	100 GB

NOTE: The integrated LSI 2002 MegaRAID controller supports hard disk drives (HDDs) or solid state drives (SSDs). Write cache is not implemented. SSDs are recommended for applications requiring high-speed local storage, which is an order of magnitude faster than HDDs.

Supported Configurations

(1) 1-Drive System

- Select one of the drives listed in ***Table 6***.

(1) 2-Drive System

- Select two identical drives from ***Table 6***. There is no support for mixing of drive types or capacities.

Caveats

- If you select two drives, they must be identical in type and capacity.

STEP 5 CHOOSE ADAPTERS

The adapter offerings are:

- Cisco Adapters: Virtual Interface Cards (VICs)

Cisco developed Virtual Interface Cards (VICs) to provide flexibility to create multiple NIC and HBA devices. The VICs also support adapter Fabric Extender and Virtual Machine Fabric Extender technologies.

- Converged Network Adapters (CNAs)

Emulex and QLogic Converged Network Adapters (CNAs) consolidate Ethernet and Storage (FC) traffic on the Unified Fabric by supporting FCoE.

- Cisco UCS Storage Accelerators

These Storage Accelerator adapters are designed specifically for the Cisco UCS B-series M3 blades servers and integrate seamlessly to allow improvement in performance and relief of I/O bottlenecks.

NOTE: There are two slots on the server. Adapter slot 2 accommodates Em ulex or QLogic I/O adapters or Cisco UCS Storage Accelerators, and adapter slot 1 is a dedicated slot for the VIC 1240 adapter only. ***Table 7*** shows which adapters plug into each of the two slots. Only the VIC 1240 adapter plugs into the VIC 1240 adapter 1 slot. All other adapters plug into the adapter 2 slot.

NOTE: You must have a B22 M3 configured with 2 CPUs to support adapters that plug into the adapter 2 connector. The VIC 1240 adapter is supported on both 1- and 2-CPU configured systems.

Choose a Mezzanine Adapter

The supported mezzanine adapters in the UCS B22 M3 are listed in *Table 7*.

Table 7 Supported Mezzanine Adapters

Product ID (PID)	PID Description	Connector
Virtual Interface Cards (VICs)		
UCSB-MLOM-40G-01	Cisco UCS VIC 1240 modular LOM for M3 blade servers. Plugs into adapter slot 1 only. It is the only adapter that can be plugged into the adapter 1 connector.	Adapter 1
UCS-VIC-M82-8P	Cisco UCS VIC 1280 dual 40 Gb capable Virtual Interface Card	Adapter 2
Converged Network Adapters (CNAs)		
UCSB-MEZ-QLG-03	Cisco UCS CNA M73KR-Q QLogic Adapter	Adapter 2
UCSB-MEZ-ELX-03	Cisco UCS CNA M73KR-E Emulex Adapter	Adapter 2
Cisco UCS Storage Accelerators[1]		
UCSB-F-FIO-1600MS	UCS 1600 GB Fusion ioMemory3 SX Scale line for B-Series	Adapter 2
UCSB-F-FIO-1300MP	UCS 1300 GB Fusion ioMemory3 PX Performance line for B-Series	Adapter 2
UCSB-F-FIO-785M	Cisco UCS 785 GB MLC Fusion ioDrive2	Adapter 2
UCSB-F-FIO-365M	Cisco UCS 365 GB MLC Fusion-io ioDrive2	Adapter 2
UCSB-F-LSI-400S	LSI 400 GB SLC WarpDrive	Adapter 2

Notes

1. Do not mix Fusion io storage accelerator families. That is, do not mix “MP” or “MS” (ioMemory3) with “M” (ioDrive2) family cards.

“Adapter 1” and “Adapter 2” refer to the UCS Manager (UCSM) naming convention for the adapter slots (this document uses the UCSM naming convention). In the server BIOS and on the motherboard, the corresponding slots are labeled as “mLOM” and “Mezz 1,” respectively. See *Table 8*.

Table 8 Adapter Slot Naming

Server BIOS and Motherboard Slot Naming	UCSM Slot Naming
mLOM (VIC 1240 only)	Adapter 1
Mezz1	Adapter 2

Supported Configurations

(1) B22 M3 Configured with 1 CPU

For a B22 M3 configured with 1 CPU, the supported configurations are listed in ***Table 9***. Choose one configuration.

Table 9 Supported Adapter[1] Combinations Options (1-CPU Configuration)

Fabric Extender Compatibility	Adapter Slot 1	Adapter Slot 2	Ports	Reference
2208XP (PIDs UCS-IOM-2208XP, UCS-IOM2208-16FET)				
2208XP	VIC 1240	None	4 x 10 Gb	***Figure 11 on page 44***
2204XP (PIDs UCS-IOM-2204XP, UCS-IOM2204-8FET)				
2204XP	VIC 1240	None	2 x 10 Gb	***Figure 12 on page 45***
2104XP (PID N20-I6584)				
2104XP	VIC 1240	None	2 x 10 Gb	***Figure 13 on page 45***

Notes

1. In the server BIOS and on the motherboard, “Adapter 1” and “Adapter 2” are labeled as “mLOM” and “Mezz 1,” respectively

(2) B22 M3 Configured with 2 CPUs

For a B22 M3 configured with 2 CPUs, the supported configurations are listed in ***Table 10***. Choose one configuration.

Table 10 Supported Adapter[1] Combinations Options (2-CPU Configuration)

Fabric Extender Compatibility	Adapter Slot 1	Adapter Slot 2	Ports	Reference
2208XP (PIDs UCS-IOM-2208XP, UCS-IOM2208-16FET)				
2208XP	None	Emulex or QLogic I/O adapter[2]	2 x 10 Gb	***Figure 14 on page 46***
2208XP	VIC 1240	None	4 x 10 Gb	***Figure 15 on page 47***
2208XP	VIC 1240	Cisco UCS Storage Accelerator	4 x 10 Gb	***Figure 16 on page 47***
2208XP	VIC 1240	Emulex or QLogic I/O adapter[2]	6 x 10 Gb	***Figure 17 on page 48***
2208XP	VIC 1240	VIC 1280	8 x 10 Gb	***Figure 18 on page 48***

Table 10 Supported Adapter[1] Combinations Options (2-CPU Configuration) *(continued)*

Fabric Extender Compatibility	Adapter Slot 1	Adapter Slot 2	Ports	Reference
2204XP (PIDs UCS-IOM-2204XP, UCS-IOM2204-8FET)				
2204XP	None	Emulex or QLogic I/O adapter[2]	2 x 10 Gb	***Figure 19 on page 49***
2204XP	VIC 1240	None	2 x 10 Gb	***Figure 20 on page 50***
2204 XP	VIC 1240	Cisco UCS Storage Accelerator	2 x 10 Gb	***Figure 21 on page 50***
2204XP	VIC 1240	Emulex or QLogic I/O adapter[2]	4 x 10 Gb	***Figure 22 on page 51***
2204XP	VIC 1240	VIC 1280	4 x 10 Gb	***Figure 23 on page 51***
2104XP (PID N20-I6584)				
2104XP	VIC 1240	None	2 x 10 Gb	***Figure 24 on page 52***
2104XP	VIC 1240	Cisco UCS Storage Accelerator	2 x 10 Gb	***Figure 25 on page 52***

Notes

1. In the server BIOS and on the motherboard, “Adapter 1” and “Adapter 2” are labeled as “mLOM” and “Mezz 1,” respectively
2. Specifically, the UCSB-MEZ-QLG-03 (QLogic) or UCSB-MEZ-ELX-03 (Emulex) adapter

Also see ***Network Connectivity on page 41*** for more information.

To help ensure that your operating system is compatible with the adapters you have selected, please check the Hardware Compatibility List at this URL:

http://www.cisco.com/en/US/products/ps10477/prod_technical_reference_list.html

Caveats

- If a VIC 1240 adapter is not installed (2-CPU configuration only), you must choose a Cisco, Emulex, or QLogic I/O adapter to be installed in adapter 2 slot (see also ***Network Connectivity on page 41***)
- The mezzanine adapters are not supported for 1-CPU configurations. You must have two CPUs installed before you can install and use mezzanine adapters.
- The 1-CPU server configuration must always have a VIC 1240 installed in the adapter 1 slot.

STEP 6 ORDER A TRUSTED PLATFORM MODULE

Trusted Platform Module (TPM) is a computer chip (microcontroller) that can securely store artifacts used to authenticate the platform (server). These artifacts can include passwords, certificates, or encryption keys. A TPM can also be used to store platform measurements that help ensure that the platform remains trustworthy. Authentication (ensuring that the platform can prove that it is what it claims to be) and attestation (a process helping to prove that a platform is trustworthy and has not been breached) are necessary steps to ensure safer computing in all environments.

The TPM ordering information is listed in ***Table 11***.

Table 11 Trusted Platform Module

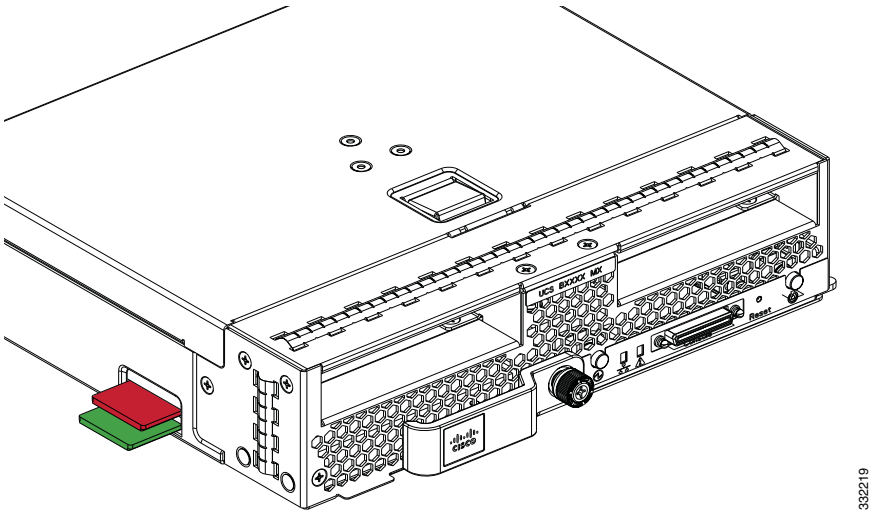
Product ID (PID)	PID Description
UCSX-TPM1-001	Trusted Platform Module for UCS

NOTE: The module used in this server conforms to TPM v1.2/1.3, as defined by the Trusted Computing Group (TCG). It is also SPI-based.

STEP 7 ORDER CISCO FLEXIBLE FLASH SECURE DIGITAL CARDS

Dual SDHC flash card sockets are provided on the front left side of the server as shown in *Figure 4*.

Figure 4 SD Locations



The SDHC card ordering information is listed in *Table 12*.

Table 12 Cisco Flexible Flash Secure Digital Cards

Product ID (PID)	PID Description
UCS-SD-16G	16 GB SD card module for UCS servers
UCS-SD-32G-S	32 GB SD card module for UCS servers

NOTE: Due to technical limitations, the 32 GB SD card only has a usable capacity of 16 GB (regardless of mirroring or not) on this particular server model and generation.

Supported Configurations

(1) Select one or two Cisco Flexible Flash secure digital cards

(2) Do not mix 16 GB cards with 32 GB cards. The allowed configurations are:

- One 16 GB card
- One 32 GB card
- Two 16 GB cards
- Two 32 GB cards

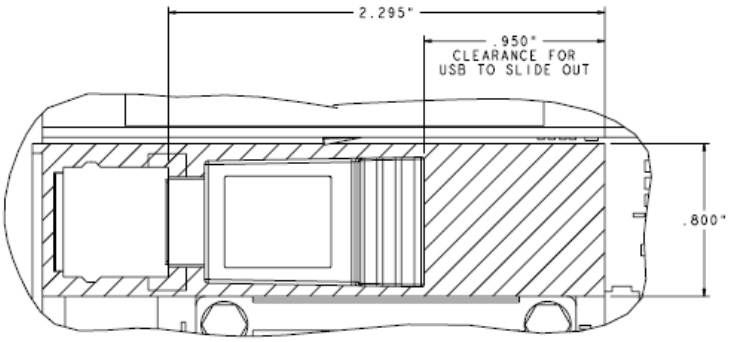
STEP 8 ORDER OPTIONAL INTERNAL USB 2.0 DRIVE

You may order one optional internal USB 2.0 drive. The USB drive ordering information is listed in *Table 13*.

Table 13 USB 2.0 Drive

Product ID (PID)	PID Description
UCS-USBFLSH-S-4GB	4GB Flash USB Drive (shorter length) for all servers except C260

NOTE: A clearance of 0.950 inches (24.1 mm) is required for the USB device to be inserted and removed (see the following figure).



See *Figure 6 on page 33* for the location of the USB connector.

NOTE: When the Cisco 4GB USB key is purchased with a server, it is pre-installed into the internal USB port and held firmly in place with a clip to protect it from shock and vibration during shipment and transportation. This clip also prevents the USB key from undergoing shock and vibration during ongoing customer operational use.

STEP 9 CHOOSE OPERATING SYSTEM AND VALUE-ADDED SOFTWARE

Several operating systems and value-added software programs are available. Select as desired from ***Table 14***.

Table 14 OSs and Value-Added Software (for 2-CPU servers)

PID Description	Product ID (PID)
Microsoft Windows Server	
MSWS-12-ST2S	Windows Server 2012 Standard (2 CPU/2 VMs)
MSWS-12-DC2S	Windows Server 2012 Datacenter (2 CPU/Unlimited VMs)
MSWS-12-ST2S-NS	Windows Server 2012 Standard (2 CPU/2 VMs) No Cisco SVC
MSWS-12-DC2S-NS	Windows Server 2012 Datacenter (2 CPU/Unlim VM) No Cisco SVC
MSWS-12R2-ST2S	Windows Server 2012 R2 Standard (2 CPU/2 VMs)
MSWS-12R2-DC2S	Windows Server 2012 R2 Datacenter (2 CPU/Unlimited VMs)
MSWS-12R2-ST2S-NS	Windows Server 2012 R2 Standard (2 CPU/2 VMs) No Cisco SVC
MSWS-12R2-DC2S-NS	Windows Server 2012 R2 Datacen (2 CPU/Unlim VM) No Cisco Svc
SUSE	
SLES-SVR-2S-1G-1A	SUSE Linux Enterprise Srvr (1-2 CPU,1 Phys);1yr Support Reqd
SLES-SVR-2S-1G-3A	SUSE Linux Enterprise Srvr (1-2 CPU,1 Phys);3yr Support Reqd
SLES-SVR-2S-1G-5A	SUSE Linux Enterprise Srvr (1-2 CPU,1 Phys);5yr Support Reqd
SLES-SVR-2S-UG-1A	SUSE Linux Enterprise Svr (1-2 CPU,Unl Vrt);1yr Support Reqd
SLES-SVR-2S-UG-3A	SUSE Linux Enterprise Svr (1-2 CPU,Unl Vrt);3yr Support Reqd
SLES-SVR-2S-UG-5A	SUSE Linux Enterprise Svr (1-2 CPU,Unl Vrt);5yr Support Reqd
SLES-SHA-2S-1A	SUSE Linux High Availability Ext (1-2 CPU); 1yr Support Reqd
SLES-SHA-2S-3A	SUSE Linux High Availability Ext (1-2 CPU); 3yr Support Reqd
SLES-SHA-2S-5A	SUSE Linux High Availability Ext (1-2 CPU); 5yr Support Reqd
SLES-HGC-2S-1A	SUSE Linux GEO Clustering for HA (1-2 CPU); 1yr Support Reqd
SLES-HGC-2S-3A	SUSE Linux GEO Clustering for HA (1-2 CPU); 3yr Support Reqd
SLES-HGC-2S-5A	SUSE Linux GEO Clustering for HA (1-2 CPU); 5yr Support Reqd
SLES-SAP-2S-1G-1A	SLES for SAP Applications (1-2 CPU,1 Phys); 1yr Support Reqd
SLES-SAP-2S-1G-3A	SLES for SAP Applications (1-2 CPU,1 Phys); 3yr Support Reqd
SLES-SAP-2S-1G-5A	SLES for SAP Applications (1-2 CPU,1 Phys); 5yr Support Reqd
SLES-SAP-2S-UG-1A	SLES for SAP Applications (1-2 CPU,Unl Vrt);1yr Support Reqd
SLES-SAP-2S-UG-3A	SLES for SAP Applications (1-2 CPU,Unl Vrt);3yr Support Reqd
SLES-SAP-2S-UG-5A	SLES for SAP Applications (1-2 CPU,Unl Vrt);5yr Support Reqd

Table 14 OSs and Value-Added Software (for 2-CPU servers) *(continued)*

PID Description	Product ID (PID)
Red Hat Enterprise Linux	
RHEL-2S-1G-1A	RHEL/2 Socket/1 Guest/1Yr Svcs Required
RHEL-2S-1G-3A	RHEL/2 Socket/1 Guest/3Yr Svcs Required
RHEL-HA-2S-1A	RHEL Option/High-Availability/2 Socket/1Yr Svcs Required
RHEL-HA-2S-3A	RHEL Option/High-Availability/2 Socket/3Yr Svcs Required
RHEL-RS-2S-1A	RHEL Option/Resilient w/Ha /2 Socket/1 Yr Svcs Required
RHEL-RS-2S-3A	RHEL Option/Resilient Storage w/ HA /2 Socket/3 Yr Svcs Reqd
RHEL-SFS-2S-1A	RHEL Option/Scalable File System/2 Socket/1 Yr Svcs Required
RHEL-SFS-2S-3A	RHEL Option/Scalable File System/2 Socket/1 Yr Svcs Required
BMC	
BMC-012	BMC BPPM Per Server
BMC-SE-4C	BMC BladeLogic Standard Edition, 4 Cores, Support Required
BMC-SE-6C	BMC BladeLogic Standard Edition, 6 Cores, Support Required
BMC-SE-8C	BMC BladeLogic Standard Edition, 8 Cores, Support Required
BMC-SE-10C	BMC BladeLogic Standard Edition, 10 Cores, Support Required
BMC-AE-4C	BMC BladeLogic Advanced Edition, 4 Cores, Support Required
BMC-AE-6C	BMC BladeLogic Advanced Edition, 6 Cores, Support Required
BMC-AE-8C	BMC BladeLogic Advanced Edition, 8 Cores, Support Required
BMC-AE-10C	BMC BladeLogic Standard Edition, 10 Cores, Support Required
Nexus 1000V for Hyper-V and vSphere	
N1K-VSG-UCS-BUN	Over half off N1K and VSG w/ purchase of UCS B/C Series
N1K-VLEM-UCS-1	Nexus 1000V License Paper Delivery (1 CPU) for bundles
VSG-VLEM-UCS-1	VSG License Paper Delivery (1 CPU) for bundles
UCS Director	
CUIC-PHY-SERV-BM-U	Cisco Cloupia Resource Lic - One Phy Server node bare metal
CUIC-PHY-SERV-U	Cisco Cloupia Resource Lic - One physical Server node
CUIC-TERM	Acceptance of Cisco Cloupia License Terms

Table 14 OSs and Value-Added Software (for 2-CPU servers) *(continued)*

PID Description	Product ID (PID)
VMware 5	
VMW-VS5-STD-1A	VMware vSphere 5 Standard for 1 Processor, 1 Year, Support Rqd
VMW-VS5-STD-2A	VMware vSphere 5 Standard for 1 Processor, 2 Year, Support Rqd
VMW-VS5-STD-3A	VMware vSphere 5 Standard for 1 Processor, 3 Year, Support Rqd
VMW-VS5-STD-4A	VMware vSphere 5 Standard for 1 Processor, 4 Year, Support Rqd
VMW-VS5-STD-5A	VMware vSphere 5 Standard for 1 Processor, 5 Year, Support Rqd
VMW-VS5-ENT-1A	VMware vSphere 5 Enterprise for 1 Processor, 1 Year Support Rqd
VMW-VS5-ENT-2A	VMware vSphere 5 Enterprise for 1 CPU, 2 Yr Support Rqd
VMW-VS5-ENT-3A	VMware vSphere 5 Enterprise for 1 CPU, 3 Yr Support Rqd
VMW-VS5-ENT-4A	VMware vSphere 5 Enterprise for 1 Processor, 4 Year Support Rqd
VMW-VS5-ENT-5A	VMware vSphere 5 Enterprise for 1 CPU, 5 Yr Support Rqd
VMW-VS5-ENTP-1A	VMware vSphere 5 Enterprise Plus for 1 Processor, 1 Year Support Rqd
VMW-VS5-ENTP-2A	VMware vSphere 5 Enterprise Plus for 1 CPU, 2 Yr Support Rqd
VMW-VS5-ENTP-3A	VMware vSphere 5 Enterprise Plus for 1 Processor, 3 Year Support Rqd
VMW-VS5-ENTP-4A	VMware vSphere 5 Enterprise Plus for 1 Processor, 4 Year Support Rqd
VMW-VS5-ENTP-5A	VMware vSphere 5 Enterprise Plus for 1 Processor, 5 Year Support Rqd
VMW-VC5-STD-1A	VMware vCenter 5 Server Standard, 1 yr support required
VMW-VC5-STD-2A	VMware vCenter 5 Server Standard, 2 yr support required
VMW-VC5-STD-3A	VMware vCenter 5 Server Standard, 3 yr support required
VMW-VC5-STD-4A	VMware vCenter 5 Server Standard, 4 yr support required
VMW-VC5-STD-5A	VMware vCenter 5 Server Standard, 5 yr support required
UCS-VMW-TERMS	Acceptance of Terms, Standalone VMW License for UCS Servers

NOTE: For additional information, see OS/hypervisor support matrix at the following link:

http://www.cisco.com/en/US/products/ps10477/prod_technical_reference_list.html

STEP 10 CHOOSE OPERATING SYSTEM MEDIA KIT

Choose the optional operating system media listed in ***Table 15***.

Table 15 OS Media

Product ID (PID)	PID Description
RHEL-6	RHEL 6 Recovery Media Only (Multilingual)
SLES-11	SLES 11 media only (multilingual)
MSWS-12-ST2S-RM	Windows Server 2012 Standard (2 CPU/2 VMs) Recovery Media
MSWS-12-DC2S-RM	Windows Server 2012 Datacenter (2 CPU/Unlimited VM) Rec Media
MSWS-12R2-ST2S-RM	Windows Server 2012 R2 Standard (2 CPU/2 VMs) Recovery Media
MSWS-12R2-DC2S-RM	Windows Server 2012 R2 Datacen(2 CPU/Unlimited VM) Rec Media

STEP 11 CHOOSE SERVICE and SUPPORT LEVEL

A variety of service options are available, as described in this section.

Unified Computing Warranty, No Contract

If you have noncritical implementations and choose to have no service contract, the following coverage is supplied:

- Three-year parts coverage.
- Next business day (NBD) onsite parts replacement eight hours a day, five days a week.
- 90-day software warranty on media.
- Ongoing downloads of BIOS, drivers, and firmware updates.
- UCSM updates for systems with Unified Computing System Manager. These updates include minor enhancements and bug fixes that are designed to maintain the compliance of UCSM with published specifications, release notes, and industry standards.

SMARTnet for UCS

For support of the entire Unified Computing System, Cisco offers the Cisco SMARTnet for UCS Service. This service provides expert software and hardware support to help sustain performance and high availability of the unified computing environment. Access to Cisco Technical Assistance Center (TAC) is provided around the clock, from anywhere in the world.

For UCS blade servers, there is Smart Call Home, which provides proactive, embedded diagnostics and real-time alerts. For systems that include Unified Computing System Manager, the support service includes downloads of UCSM upgrades. The Cisco SMARTnet for UCS Service includes flexible hardware replacement options, including replacement in as little as two hours. There is also access to Cisco's extensive online technical resources to help maintain optimal efficiency and uptime of the unified computing environment. You can choose a desired service listed in ***Table 16***.

Table 16 Cisco SMARTnet for UCS Service

Product ID (PID)	On Site?	Description
CON-PREM-B22M3	Yes	ONSITE 24X7X2 UCS B22 M3 Server
CON-OSP-B22M3	Yes	ONSITE 24X7X4 UCS B22 M3 Server
CON-OSE-B22M3	Yes	ONSITE 8X5X4 UCS B22 M3 Server
CON-OS-B22M3	Yes	ONSITE 8X5XNBD UCS B22 M3 Server
CON-S2P-B22M3	No	SMARTNET 24X7X2 UCS B22 M3 Server
CON-SNTP-B22M3	No	SMARTNET 24X7X4 UCS B22 M3 Server
CON-SNTE-B22M3	No	SMARTNET 8X5X4 UCS B22 M3 Server
CON-SNT-B22M3	No	SMARTNET 8X5XNBD UCS B22 M3 Server

SMARTnet for UCS Hardware Only Service

For faster parts replacement than is provided with the standard Cisco Unified Computing System warranty, Cisco offers the Cisco SMARTnet for UCS Hardware Only Service. You can choose from two levels of advanced onsite parts replacement coverage in as little as four hours. SMARTnet for UCS Hardware Only Service provides remote access any time to Cisco support professionals who can determine if a return materials authorization (RMA) is required. You can choose a service listed in ***Table 17***.

Table 17 SMARTnet for UCS Hardware Only Service

Product ID (PID)	Service Level GSP	On Site?	Description
CON-UCW7-B22M3	UCW7	Yes	UC PLUS 24X7X4OS UCS B22 M3 Server
CON-UCW5-B22M3	UCW5	Yes	UC PLUS 8X5XNBDOS UCS B22 M3 Server

Unified Computing Partner Support Service

Cisco Partner Support Service (PSS) is a Cisco Collaborative Services service offering that is designed for partners to deliver their own branded support and managed services to enterprise customers. Cisco PSS provides partners with access to Cisco's support infrastructure and assets to help them:

- Expand their service portfolios to support the most complex network environments
- Lower delivery costs
- Deliver services that increase customer loyalty

Partner Unified Computing Support Options enable eligible Cisco partners to develop and consistently deliver high-value technical support that capitalizes on Cisco intellectual assets. This helps partners to realize higher margins and expand their practice.

PSS is available to all Cisco PSS partners, but requires additional specializations and requirements. For additional information, see the following URL:

www.cisco.com/go/partnerucssupport

The two Partner Unified Computing Support Options include:

- Partner Support Service for UCS
- Partner Support Service for UCS Hardware Only

Partner Support Service for UCS provides hardware and software support, including triage support for third party software, backed by Cisco technical resources and level three support. See ***Table 18***.

Table 18 Partner Support Service for UCS

Product ID (PID)	Service Level GSP	On Site?	Description
CON-PSJ1-B22M3	PSJ1	No	UCS SUPP PSS 8X5XNBD UCS B22 M3 Server
CON-PSJ2-B22M3	PSJ2	No	UCS SUPP PSS 8X5X4 UCS B22 M3 Server
CON-PSJ3-B22M3	PSJ3	No	UCS SUPP PSS 24X7X4 UCS B22 M3 Server
CON-PSJ4-B22M3	PSJ4	No	UCS SUPP PSS 24X7X2 UCS B22 M3 Server

Partner Support Service for UCS Hardware Only provides customers with replacement parts in as little as two hours. See ***Table 19***.

Table 19 Partner Support Service for UCS (Hardware Only)

Product ID (PID)	Service Level GSP	On Site?	Description
CON-PSW2-B22M3	PSW2	No	UCS W PL PSS 8X5X4 UCS B22 M3 Server
CON-PSW3-B22M3	PSW3	No	UCS W PL PSS 24X7X4 UCS B22 M3 Server
CON-PSW4-B22M3	PSW4	No	UCS W PL PSS 24X7X2 UCS B22 M3 Server

Unified Computing Combined Support Service

Combined Services makes it easier to purchase and manage required services under one contract. SMARTnet services for UCS help increase the availability of your vital data center infrastructure and realize the most value from your unified computing investment. The more benefits you realize from the Cisco Unified Computing System (Cisco UCS), the more important the technology becomes to your business. These services allow you to:

- Optimize the uptime, performance, and efficiency of your UCS
- Protect your vital business applications by rapidly identifying and addressing issues
- Strengthen in-house expertise through knowledge transfer and mentoring
- Improve operational efficiency by allowing UCS experts to augment your internal staff resources
- Enhance business agility by diagnosing potential issues before they affect your operations

You can choose a service listed in ***Table 20***.

Table 20 UCS Computing Combined Support Service

Product ID (PID)	Service Level GSP	On Site?	Description
CON-NCF2-B22M3	NCF2	No	CMB SPT SVC 24X7X2 UCS B22 M3 Server
CON-NCF2P-B22M3	NCF2P	Yes	CMB SPT SVC 24X7X2OS UCS B22 M3 Server
CON-NCF4P-B22M3	NCF4P	Yes	CMB SPT SVC 24X7X4OS UCS B22 M3 Server
CON-NCF4S-B22M3	NCF4S	Yes	CMB SPT SVC 8X5X4OS UCS B22 M3 Server
CON-NCFCS-B22M3	NCFCS	Yes	CMB SPT SVC 8X5XNBDOS UCS B22 M3 Server
CON-NCFE-B22M3	NCFE	No	CMB SPT SVC 8X5X4 UCS B22 M3 Server
CON-NCFP-B22M3	NCFP	No	CMB SPT SVC 24X7X4 UCS B22 M3 Server
CON-NCFT-B22M3	NCFT	No	CMB SPT SVC 8X5XNBD UCS B22 M3 Server

Unified Computing Drive Retention Service

With the Cisco Unified Computing Drive Retention (UCDR) Service, you can obtain a new disk drive in exchange for a faulty drive without returning the faulty drive. In exchange for a Cisco replacement drive, you provide a signed Certificate of Destruction (CoD) confirming that the drive has been removed from the system listed, is no longer in service, and has been destroyed.

Sophisticated data recovery techniques have made classified, proprietary, and confidential information vulnerable, even on malfunctioning disk drives. The UCDR service enables you to retain your drives and ensures that the sensitive data on those drives is not compromised, which reduces the risk of any potential liabilities. This service also enables you to comply with regulatory, local, and federal requirements.

If your company has a need to control confidential, classified, sensitive, or proprietary data, you might want to consider one of the Drive Retention Services listed in ***Table 21***.

NOTE: Cisco does not offer a certified drive destruction service as part of this service.

Table 21 Drive Retention Service Options

Service Description	Service Program Name	Service Level GSP	Service Level	Product ID (PID)
SMARTnet for UCS Service with Drive Retention	UCS DR	UCSD7	24x7x4 Onsite	CON-UCSD7-B22M3
		UCSD7	8x5xNBD Onsite	CON-UCSD5-B22M3

Table 21 Drive Retention Service Options *(continued)*

Service Description	Service Program Name	Service Level GSP	Service Level	Product ID (PID)
SMARTnet for UCS HW ONLY+Drive Retention	UCS HW+DR	UCWD7	24x7x4 Onsite	CON-UCWD7-B22M3
		UCWD5	8x5xNBD Onsite	CON-UCWD5-B22M3

For more service and support information, see the following URL:

http://www.cisco.com/en/US/services/ps2961/ps10312/Unified_Computing_Services_Overview.pdf

For a complete listing of available services for Cisco Unified Computing System, see this URL:

http://www.cisco.com/en/US/products/ps10312/serv_group_home.html

ORDER OPTIONAL KVM LOCAL I/O CABLE*

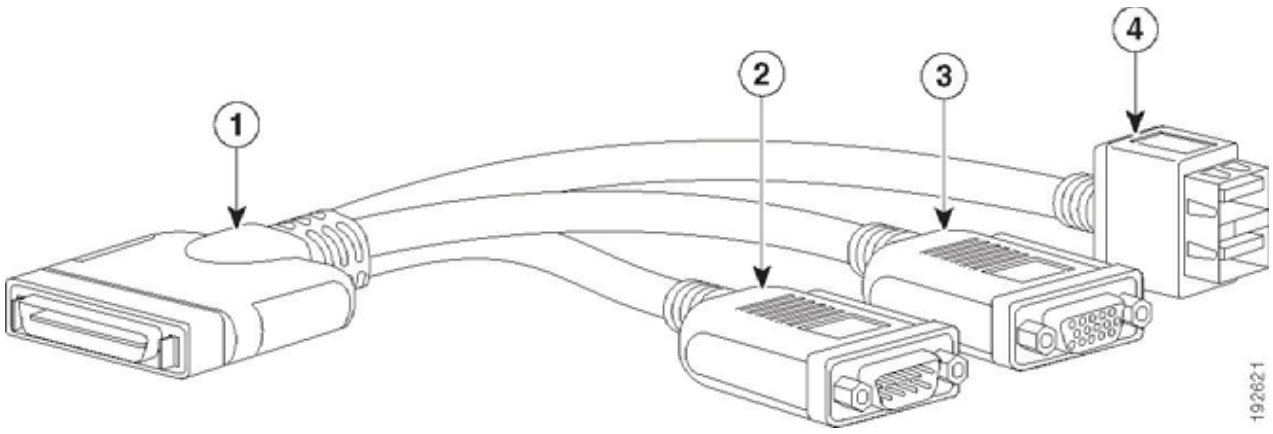
The KVM local I/O cable ships with every UCS 5100 Series blade server chassis accessory kit. The KVM local I/O cable provides a connection into the server, providing a DB9 serial connector, a VGA connector for a monitor, and dual USB ports for a keyboard and mouse. With this cable, you can create a direct connection to the operating system and the BIOS running on the server.

The KVM local I/O cable ordering information is listed in ***Table 22***.

Table 22 KVM Local I/O Cable

Product ID (PID)	PID Description
N20-BKVM=	KVM local IO cable for UCS servers console port

Figure 5 KVM Local I/O Cable



1	Connector (to server front panel)	**3**	VGA connector (for a monitor)
2	DB-9 serial connector	**4**	Two-port USB connector (for a mouse and keyboard)

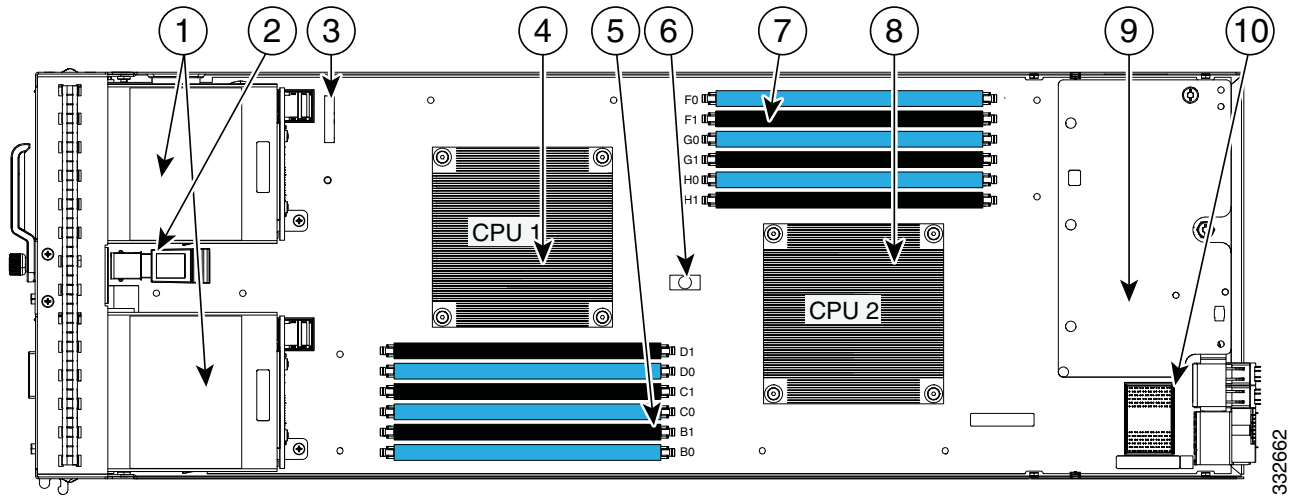
NOTE: *The blade chassis ships with the KVM local I/O cable.

SUPPLEMENTAL MATERIAL

System Board

A top view of the UCS B22 M3 system board is shown in ***Figure 6***.

Figure 6 UCS B22 M3 System Board



1	Drive bays	**6**	Diagnostic button
2	Internal USB connector[1]	**7**	CPU 2 DIMM slots
3	Battery	**8**	CPU 2 and heat sink
4	CPU 1 and heat sink	**9**	Modular LOM (shown installed)
5	CPU 1 DIMM slots	**10**	Mezzanine adapter connector (adapter not shown)

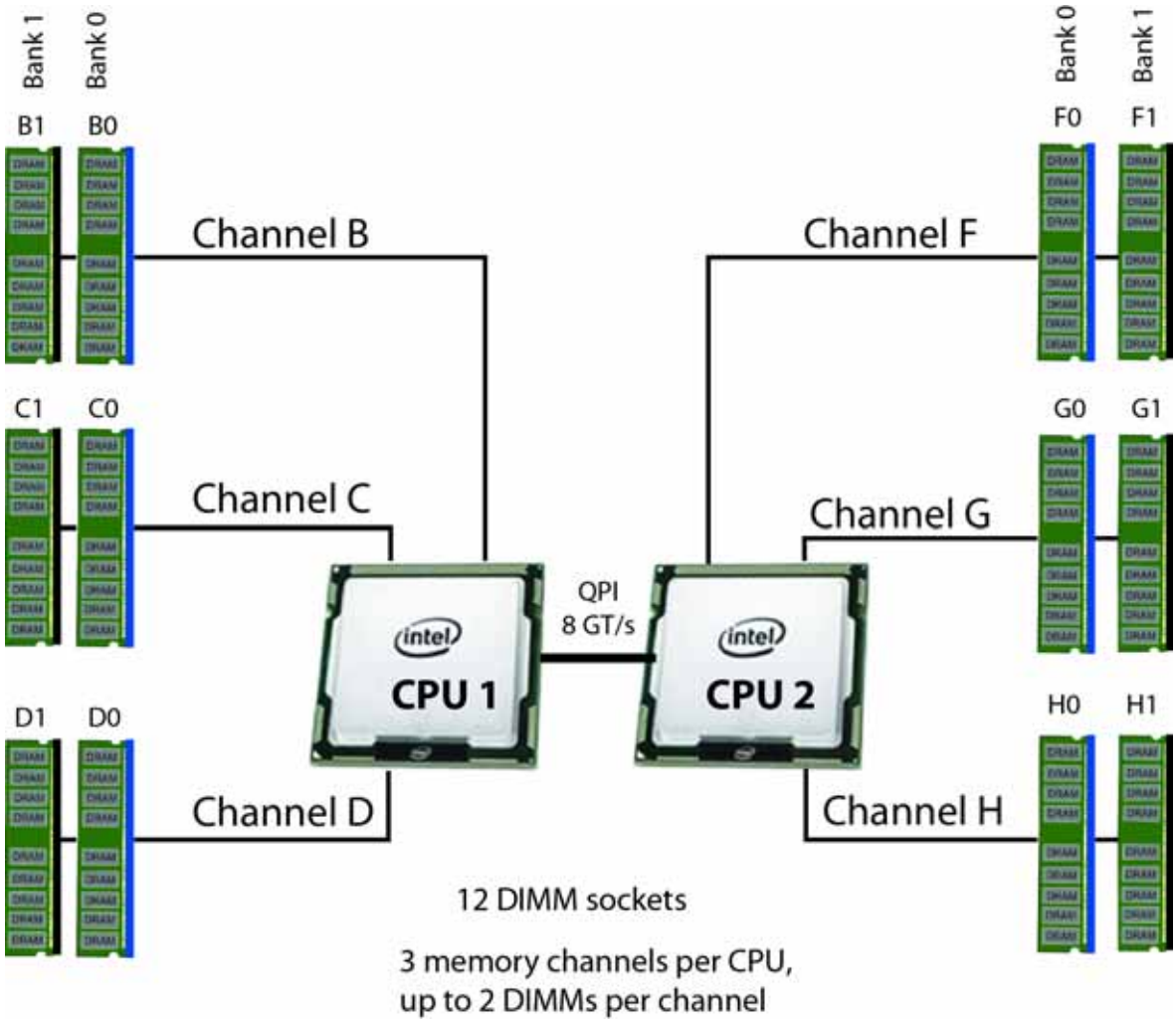
Notes

1. A USB device installed in this connector must have sufficient clearance to easily slide in and out. The Cisco USB device clearance is 0.950 inches (24.1 mm), which is a sufficient amount of clearance.

DIMM and CPU Layout

Memory is organized as shown in ***Figure 7***.

Figure 7 UCS B22 M3 Memory Organization

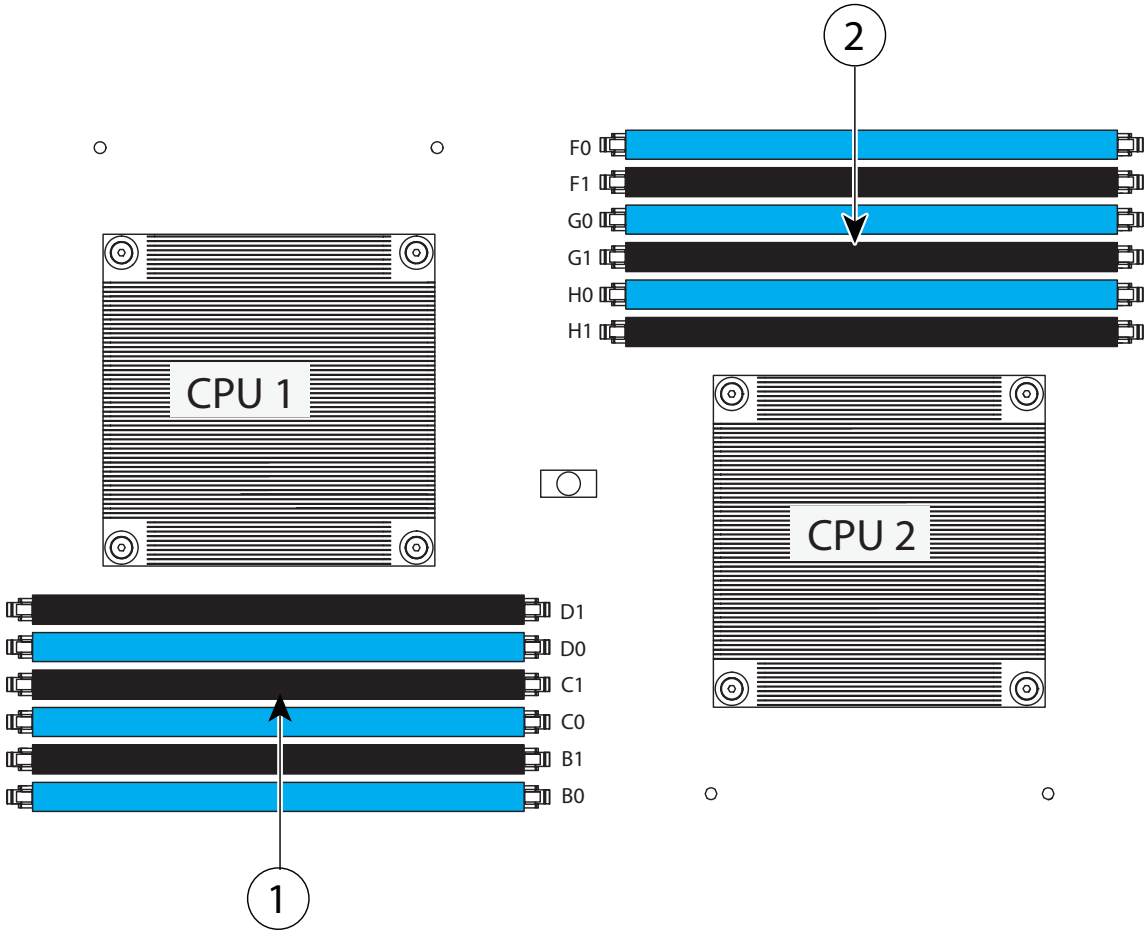


Each CPU controls three memory channels, as follows:

- CPU1: Channels B, C, and D
  - Bank 0 - B0, C0, and D0 (blue DIMM slots)
  - Bank 1 - B1, C1, and D1 (black DIMM slots)
- CPU2: Channels F, G, and H
  - Bank 0 - F0, G0, and H0 (blue DIMM slots)
  - Bank 1 - F, G1, and H1 (black DIMM slots)

The DIMM and CPU physical layout is shown in ***Figure 8***. The 6 DIMM slots at the left are controlled by CPU 1 and the 6 DIMM slots on the right are controlled by CPU 2.

Figure 8 DIMM and CPU Layout



1	Channels B-D for CPU 1	**2**	Channels F-H for CPU 2

DIMM Population

Recommended DIMM Populations

Table 23 shows the recommended DIMM slot populations.

Table 23 Recommended DIMM Population

DIMMs per Channel	DIMMs in Each Channel	1-CPU Memory Size	2-CPU Memory Size	DIMM Speed
1	8 GB	24	48	1600 MHz
	16 GB	48	96	1600 MHz
	32 GB	96	192	1600 MHz
2	4 GB + 4 GB	24	48	1600 MHz
	8 GB + 8 GB	48	96	1600 MHz
	16 GB + 16 GB	96	192	1600 MHz
	4 GB + 8 GB	36	72	1600 MHz
	4 GB + 16 GB	60 GB	120 GB	1600 MHz
	8 GB + 16 GB	72 GB	144 GB	1600 MHz
	32 GB + 32 GB	192 GB	384 GB	160 MHz

If 4 GB DIMMs are mixed with 8 GB or 16 GB DIMMs, the DIMM slots are populated as shown in *Table 24*.

Table 24 4 GB DIMMs Mixed with 8 GB or 16 GB DIMMs

Total Memory (GB)	Number of CPUs	CPU 1 DIMM Size (GB) Populated						CPU 2 DIMM Size (GB) Populated					
		B0	B1	C0	C1	D0	D1	F0	F1	G0	G1	H0	H1
12/20	1	4	8/16	none	none	none	none	none	none	none	none	none	none
24/40		4	4	8/16	8/16	none	none	none	none	none	none	none	none
20/28		4	4	4	4	none	none	none	none	none	none	none	none
16		4	4	4	4	none	none	none	none	none	none	none	none
32/48		4	4	4	4	8/16	8/16	none	none	none	none	none	none
28/36		4	4	4	4	4	8/16	none	none	none	none	none	none

Table 24 4 GB DIMMs Mixed with 8 GB or 16 GB DIMMs *(continued)*

Total Memory (GB)	Number of CPUs	CPU 1 DIMM Size (GB) Populated						CPU 2 DIMM Size (GB) Populated					
		B0	B1	C0	C1	D0	D1	F0	F1	G0	G1	H0	H1
24/40	2	4	8/16	none	none	none	none	4	8/16	none	none	none	none
48/80		4	4	8/16	8/16	none	none	4	4	8/16	8/16	none	none
40/56		4	4	4	8/16	none	none	4	4	4	8/16	none	none
32		4	4	4	4	none	none	4	4	4	4	none	none
64/96		4	4	4	4	8/16	8/16	4	4	4	4	8/16	8/16
56/72		4	4	4	4	4	8/16	4	4	4	4	4	8/16

Upgrade and Servicing-Related Parts

This section lists the upgrade and servicing-related parts you may need during the life of your server. Some of these parts are configured with every server or with every UCS 5108 blade server chassis, and some may be ordered when needed or may be ordered and kept on hand as spares for future use. See ***Table 25***.

Table 25 Upgrade and Servicing-related Parts for UCS B22 M3 Server

Spare Product ID (PID)	Description
N20-BBLKD=	2.5-inch HDD Blanking Panel[1]
N20-CBLKB1=	Blade slot blanking panel for UCS 5108/single slot[2]
N20-BHTS1=	CPU heat sink for UCS B22 M3 and B200 M1/M2 Blade Servers[1]
UCS-CPU-LPCVR-EN=	CPU load plate dust cover (for unpopulated CPU sockets)
UCSB-BAFF-B22-M3=	Air Baffle Replacement Kit for B22 M3 Server[1]
N20-MBLIBATT=	Replacement Lithium Battery for Server Motherboard (CR2032)[1]
N20-BKVM=	KVM local IO cable for UCS servers console port[2]
UCS-CPU-EP-PNP=	Pick n place CPU tool set (for Intel E5 EP Socket R)[3]
UCS-CPU-GREASE=	CPU thermal grease syringe - needed for heat sink seal[3]
UCSX-HSCK=	UCS Processor Heat Sink Cleaning Kit (when replacing a CPU)[3]

Notes

1. This part is included/configured with your UCS server (in some cases, as determined by the configuration of your server).
2. This part is included/configured with the UCS 5108 blade server chassis.
3. This part is included with the purchase of an optional or spare CPU processor kit.

Drive and Blade Server Blanking Panels

A drive blanking panel (N20-BBLKD=) must be installed if you remove a disk drive from a UCS server. Similarly, a blade server blanking panel (N20-CBLKB1=) must be installed if you remove a half-width blade server (such as a UCS B22 M3 server) from a blade server chassis. These panels are required to maintain system temperatures at safe operating levels, and to keep dust away from system components.

Adding an Additional CPU (with CPU heat sink)

All Cisco UCS two CPU socket-capable servers can be upgraded from having one to having two CPUs configured. You will need to order and install a heat sink when adding any additional CPU to a server. Instructions for installing the new CPU and heat sink can be found at the following link:

http://www.cisco.com/en/US/docs/unified_computing/ucs/hw/chassis/install/b22.html#wp1010281

Motherboard Lithium Battery

You can order a replacement motherboard battery. Installation instructions are found at this link:

http://www.cisco.com/en/US/docs/unified_computing/ucs/hw/chassis/install/b22.html#wp1034829

CPU Removal and Installation ("pick n place") Tool Set

The Pick n Place tool set includes two tools:

- Pick and pull cap tool - used to pull off the plastic protective cap covering an empty CPU socket and to remove or lift a CPU processor without touching it
- Pick and place tool - used to install a CPU in its socket without damage. Must be used each time a CPU is installed in a UCS "M3" server.

Instructions for using this tool set are found at the following link:

http://www.cisco.com/en/US/docs/unified_computing/ucs/hw/chassis/install/b22.html#wp1010281

NOTE: When you purchase a spare CPU, the Pick n Place Toolkit is included.

Thermal Grease (with syringe applicator) for CPU to Heatsink Seal

Thermal grease must be applied to the top of the CPU where it comes in contact with the heat sink. Instructions for applying thermal grease are found at:

http://www.cisco.com/en/US/docs/unified_computing/ucs/hw/chassis/install/b22.html#wp1010281

CAUTION: Use only the thermal grease specified for this server (UCS-CPU-GREASE=). Thermal grease for other systems may have different thermal conductivity properties and may cause overheating if used in the B22 M3 server. DO NOT use thermal grease available for purchase at any commercial electronics store. If these instructions are not followed, the CPU may overheat and be destroyed.

NOTE: When you purchase a spare CPU, the thermal grease with syringe applicator is included.

Air Baffle Replacement Kit

Air baffles are designed to direct airflow through the server to maintain server temperature at a safe operating level. The UCS B22 M3 server comes shipped with two identical air baffles covering the DIMM socket areas of the server. These baffles must always remain installed during server operation. The Air Baffle Replacement Kit includes the two (identical) air baffles needed for one UCS B22 M3 server. For instructions on how to remove and replace the air baffles, see the following link:

http://www.cisco.com/en/US/docs/unified_computing/ucs/hw/chassis/install/b22.html#wp1034378

CPU Heat Sink Cleaning Kit

The cleaning kit is used to remove the existing thermal compound from the bottom of the heat sink during a CPU replacement process. Instructions for cleaning are found at the following link:

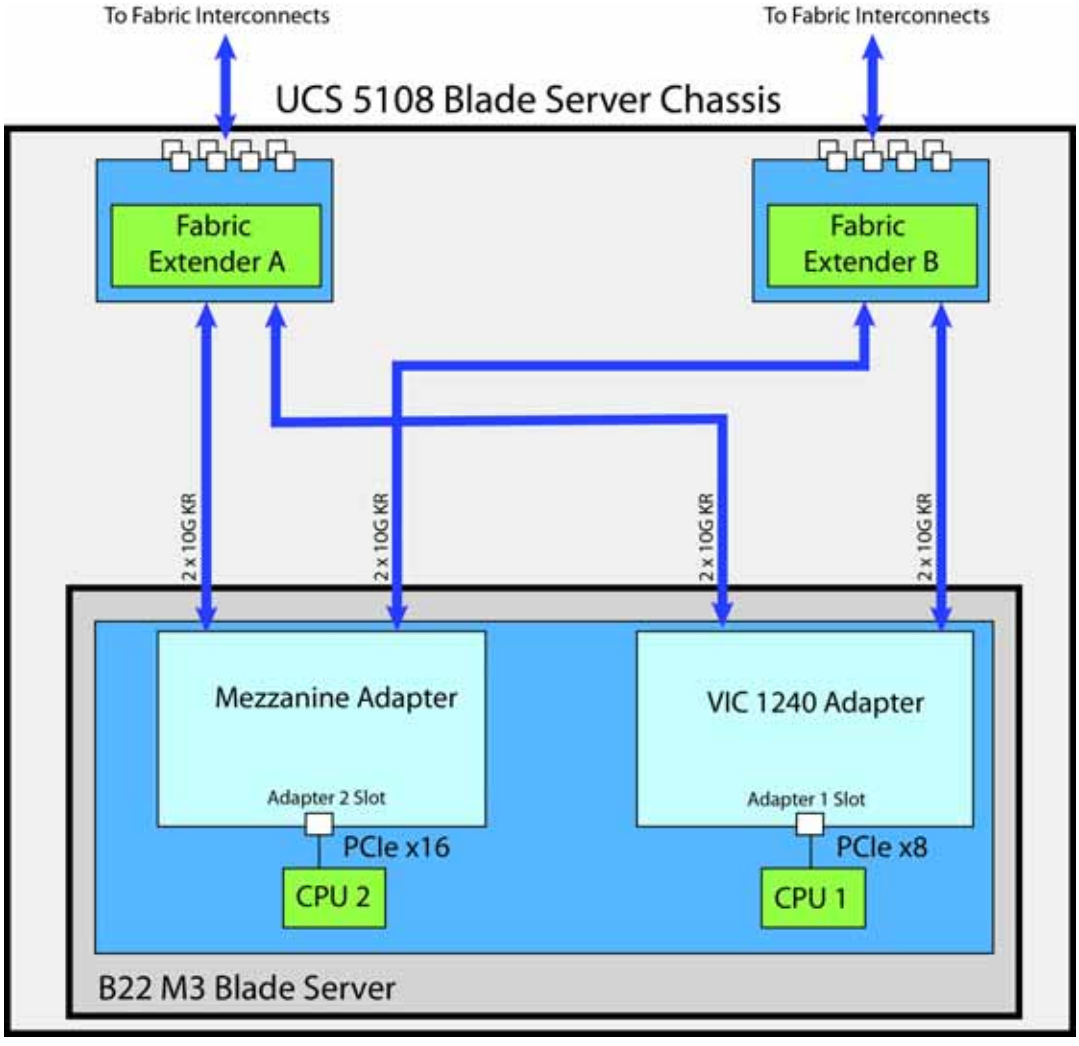
http://www.cisco.com/en/US/docs/unified_computing/ucs/hw/chassis/install/b22.html#wp1010281

NOTE: When you purchase a spare CPU, the CPU cleaning kit is included.

Network Connectivity

This section explains how the UCS B22 M3 server connects to Fabric Interconnects using the network I/O adapters in the UCS B22 M3 blade server and the Fabric Extender modules in the UCS 5108 blade server chassis. The UCS B22 M3 server plugs into the front of the UCS 5108 blade server chassis. The Fabric Extender modules plug into the back of the UCS 5108 series blade server chassis. A midplane connects the UCS B22 M3 blade server to the Fabric Extenders. ***Figure 9*** shows an example configuration where two 2 x 10G KR ports are routed from the VIC 1240 adapter to the Fabric Extender modules, and two 2 x 10G KR ports are routed from the mezzanine adapter to the Fabric Extender modules.

Figure 9 UCS B22 M3 Connections to the Fabric Extenders



The server accommodates two types of network I/O adapters. One is the Cisco VIC 1240 network I/O adapter. The other is a Cisco, Emulex, or QLogic I/O adapter or Cisco UCS Storage Accelerator mezzanine adapter. The VIC 1240 is the only adapter that can be used in the VIC 1240 (adapter 1) slot. All other types of adapters plug into the mezzanine (adapter 2) slot.

The network adapter options are:

- VIC 1240 adapter. This adapter plugs into the VIC 1240 (adapter 1) slot and is natively capable of 4x10Gb ports and 256 PCIe devices.
- VIC 1280 Mezzanine adapter. This adapter plugs into the mezzanine (adapter 2) slot and is capable of 4x10Gb ports in the UCS B22 M3 server, depending on the Fabric Extender chosen (see ***Table 8 on page 17***) and 256 PCIe devices.
- Emulex or QLogic I/O adapter or Cisco UCS Storage Accelerator mezzanine adapter. These adapters plug into the mezzanine (adapter 2) slot. The Cisco UCS Storage Accelerators do not have network connectivity; instead they provide independent high-speed storage controlled by CPU 2. See ***Table 7 on page 17*** for descriptions.

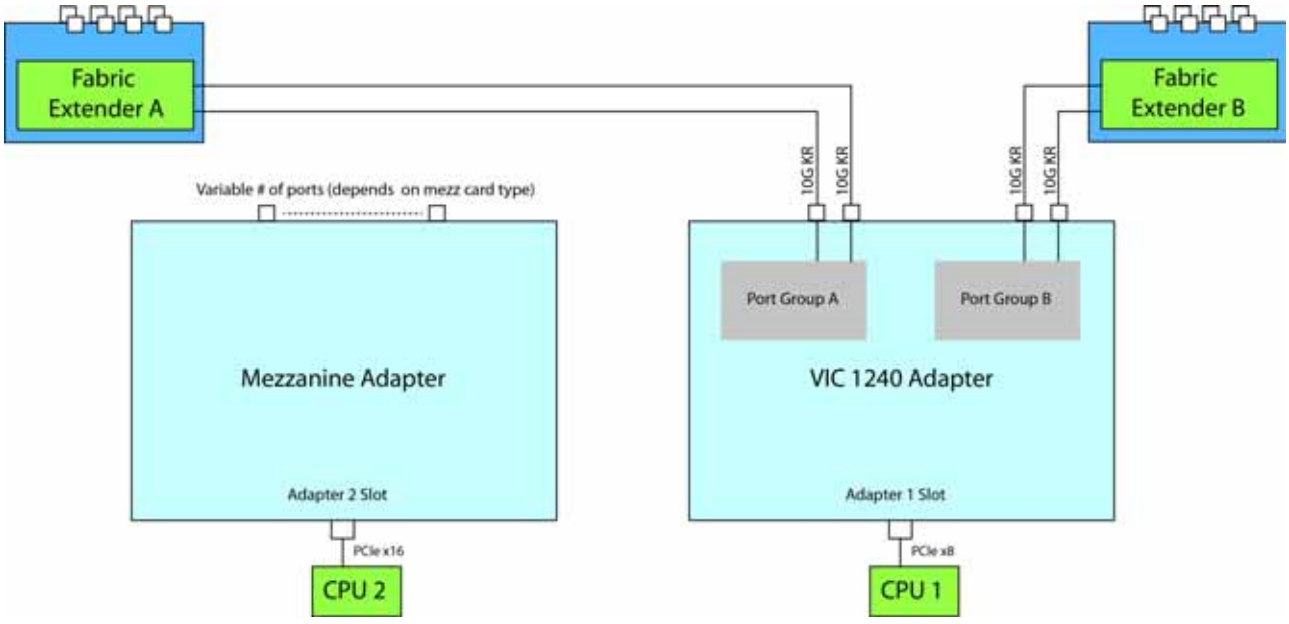
NOTE: External bandwidth is a function of both the fabric extender and the adapter(s) installed. With two 2204XP fabric extenders, the maximum bandwidth per half width B22 blade is 4 x 10Gb. With two 2208XP fabric extenders, the maximum bandwidth per half width B22 blade is 8 x 10 Gb.

VIC 1240 Adapter

The only adapter that can be plugged in to the VIC 1240 slot is the VIC 1240, a Cisco-designed PCIe-based adapter that in the UCS B22 M3 server provides up to four (depending on the Fabric Extender option chosen) 10 Gigabit Data Center Ethernet (DCE) network interfaces.

Two ports are wired through the UCS 5108 Blade Server chassis to Fabric Extender A and to Fabric Extender B as represented in ***Figure 10***.

Figure 10 VIC 1240 Port Connectivity



Mezzanine Adapters

There are multiple options for the mezzanine slot:

- I/O-based PCIe adapters (such as network adapters), or
- Cisco UCS Storage Accelerators (such as memory cards)

NOTE: In a B22 M3 configured with 2 CPUs, if a UCS B22 M3 blade server does not have a VIC 1240 installed, the mezzanine slot is required to have a network adapter installed. In a B22 M3 configured with 1 CPU, however, a VIC 1240 must always be installed.

Specific examples of mezzanine adapters are:

- Cisco adapters
  - VIC 1280
- Emulex and QLogic I/O adapters
  - Emulex M73KR-E
  - QLogic M73KR-Q
- Cisco UCS Storage Accelerators
  - 785 GB MLC Fusion ioDrive2
  - LSI 400 GB SLC WarpDrive

The following sections explain the various I/O options that are possible with the different Fabric Extenders (Cisco UCS 2208XP, 2204XP, and 2104XP) and the VIC 1240 and mezzanine adapters.

B22 M3 Configured with 1 CPU

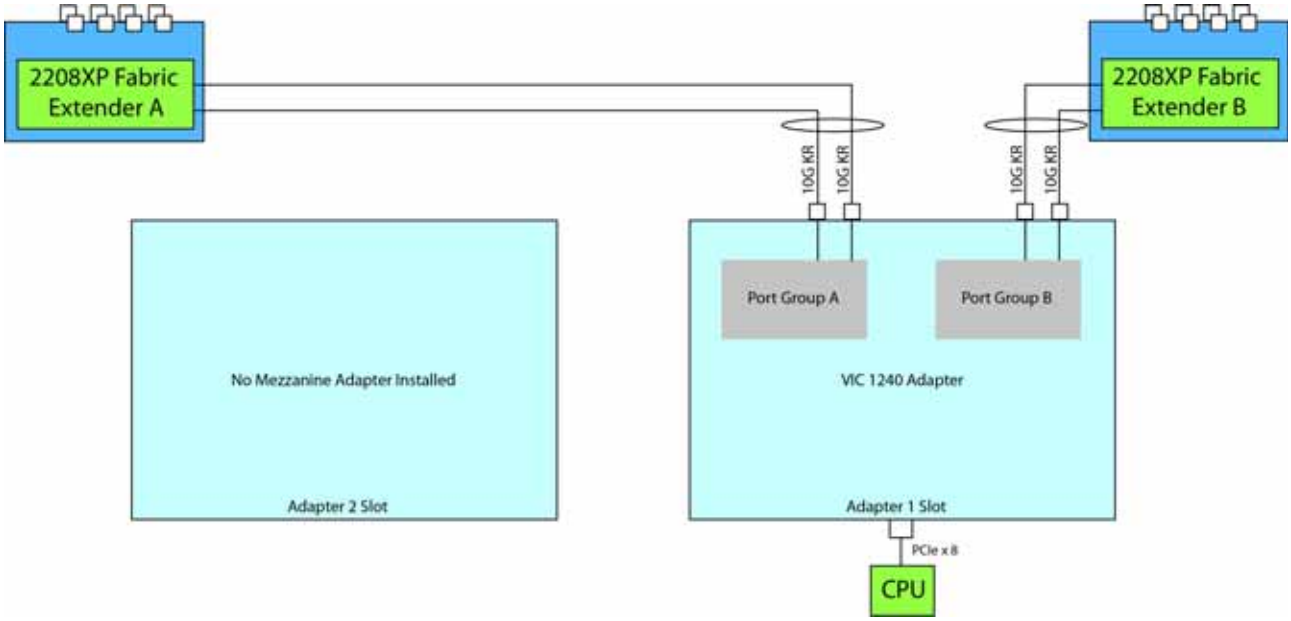
In a B22 M3 configured with 1 CPU, the mezzanine card slot (adapter 2 slot) is not under the control of a CPU (in a B22 M3 configured with 2 CPUs, CPU 2 controls the adapter 2 slot). Therefore, in this configuration, no adapter is supported in the adapter 2 slot and the VIC 1240 is always required to be installed in the adapter 1 slot.

Connectivity using the Cisco UCS 2208XP Fabric Extender

The Cisco UCS 2208XP is the second-generation Fabric Extender, and shares the same form factor as the current UCS 2100 series. The 2208XP is backwards compatible with the UCS 5108 Blade serve chassis.

The option shown in ***Figure 11*** demonstrates how a 1-CPU server is connected to the Cisco UCS 2208XP. Two ports from the VIC 1240 are channeled to 2208XP Fabric Extender A and two are channeled to 2208XP Fabric Extender B. The result is 20 Gbps of bandwidth to each Fabric Extender.

Figure 11 VIC 1240 to UCS 2208XP Fabric Extender (no mezzanine adapter)

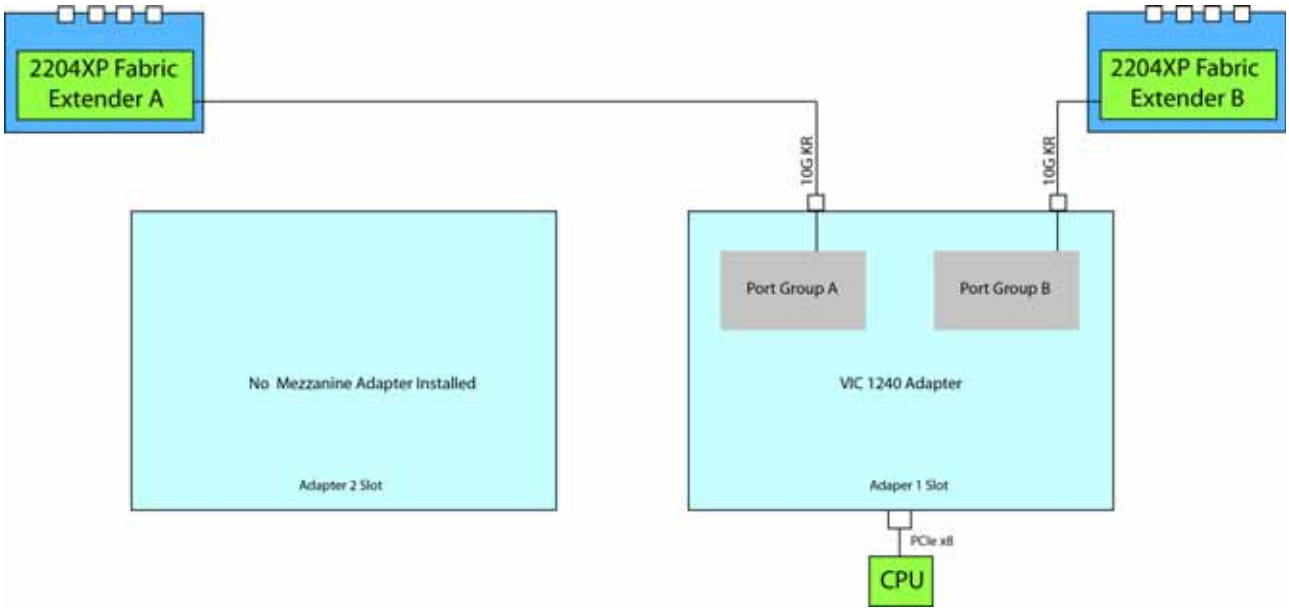


Connectivity using the Cisco UCS 2204XP Fabric Extender

The Cisco UCS 2204XP is a second-generation Fabric Extender, and shares the same form factor as the current UCS 2100 series. The 2204XP is backwards compatible with the UCS 5108 Blade serve chassis.

The option shown in ***Figure 12*** demonstrates how a 1-CPU server is connected to the Cisco UCS 2208XP. One port from the VIC 1240 is channeled to 2204XP Fabric Extender A and one is channeled to 2204XP Fabric Extender B. The result is 10 Gbps of bandwidth to each Fabric Extender.

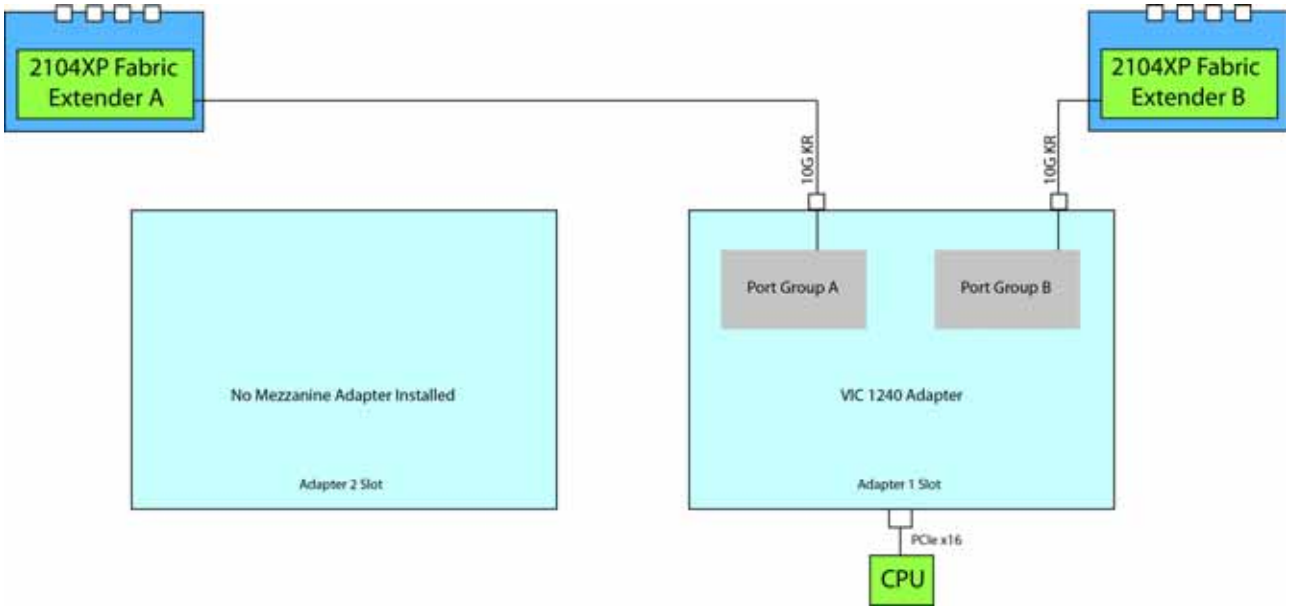
Figure 12 VIC 1240 to UCS 2204XP Fabric Extender (no mezzanine adapter)



Connectivity using the Cisco UCS 2104XP Fabric Extender

The option shown in ***Figure 13*** demonstrates how a 1-CPU server is connected to the Cisco UCS 2104XP. One port from the VIC 1240 is channeled to 2104XP Fabric Extender A and one is channeled to 2104XP Fabric Extender B. The result is 10 Gbps of bandwidth to each Fabric Extender.

Figure 13 VIC 1240 to UCS 2104XP Fabric Extender (no mezzanine adapter)



B22 M3 Configured with 2 CPUs

Connectivity using the Cisco UCS 2208XP Fabric Extender

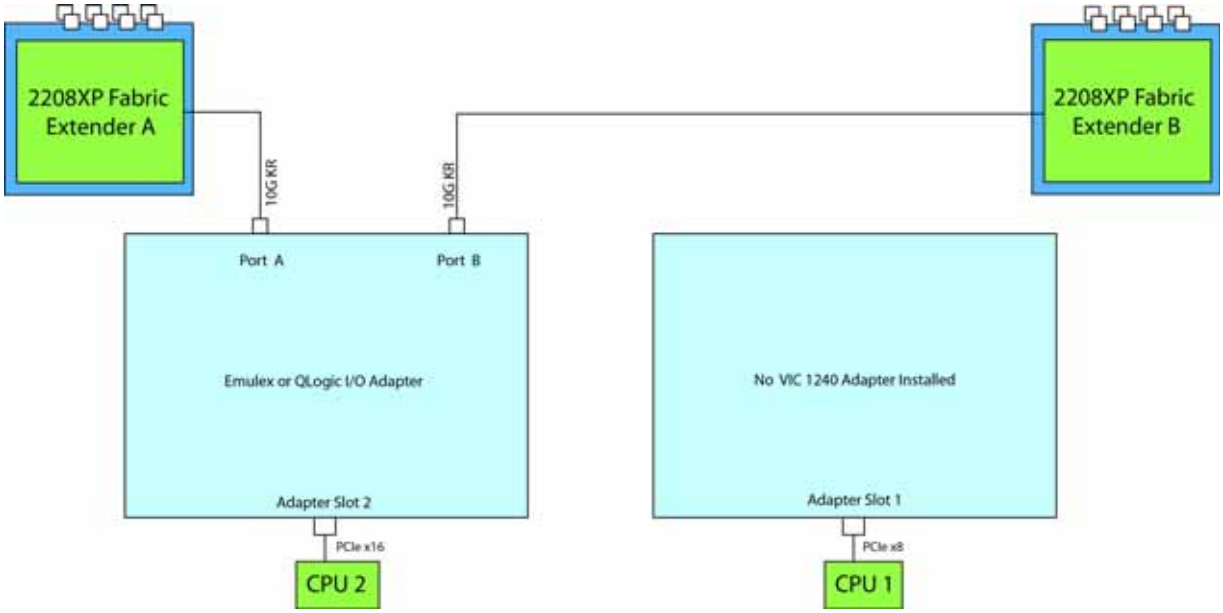
The Cisco UCS 2208XP is the second-generation Fabric Extender, and shares the same form factor as the current UCS 2100 series. The 2208XP is backwards compatible with the UCS 5108 Blade server chassis.

The options shown in ***Figure 14*** through ***Figure 18*** demonstrate how the server uses these options:

- Emulex or QLogic I/O adapter to 2208XP
- VIC 1240 to 2208XP
- VIC 1240 and Cisco UCS Storage Accelerator to 2208XP
- VIC 1240 and Emulex or QLogic I/O adapter to 2208XP
- VIC 1240 and VIC 1280 to 2208XP

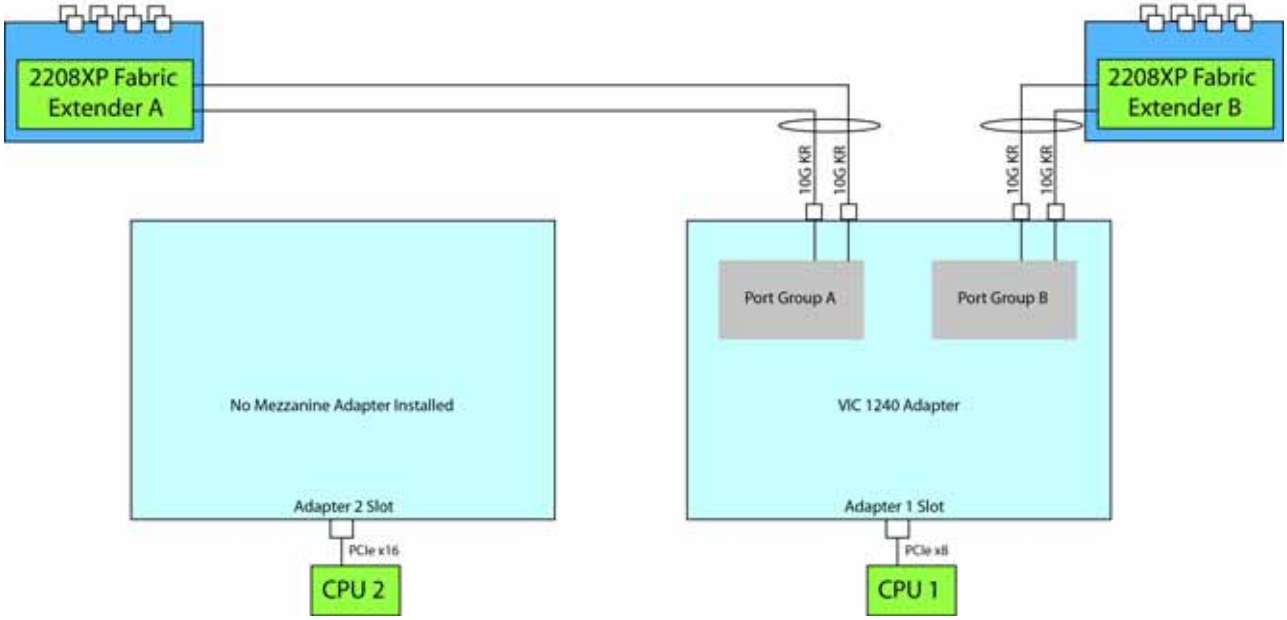
In ***Figure 14***, there is no VIC 1240 adapter installed. In this case, a Cisco, Emulex, or QLogic I/O adapter must be installed in the adapter 2 slot. Ports A and B of the mezzanine adapter connect to the Fabric Extenders, providing 10 Gbps per port.

Figure 14 Option 1 - Emulex or QLogic I/O Adapter to UCS 2208XP Fabric Extender (no VIC 1240 adapter)



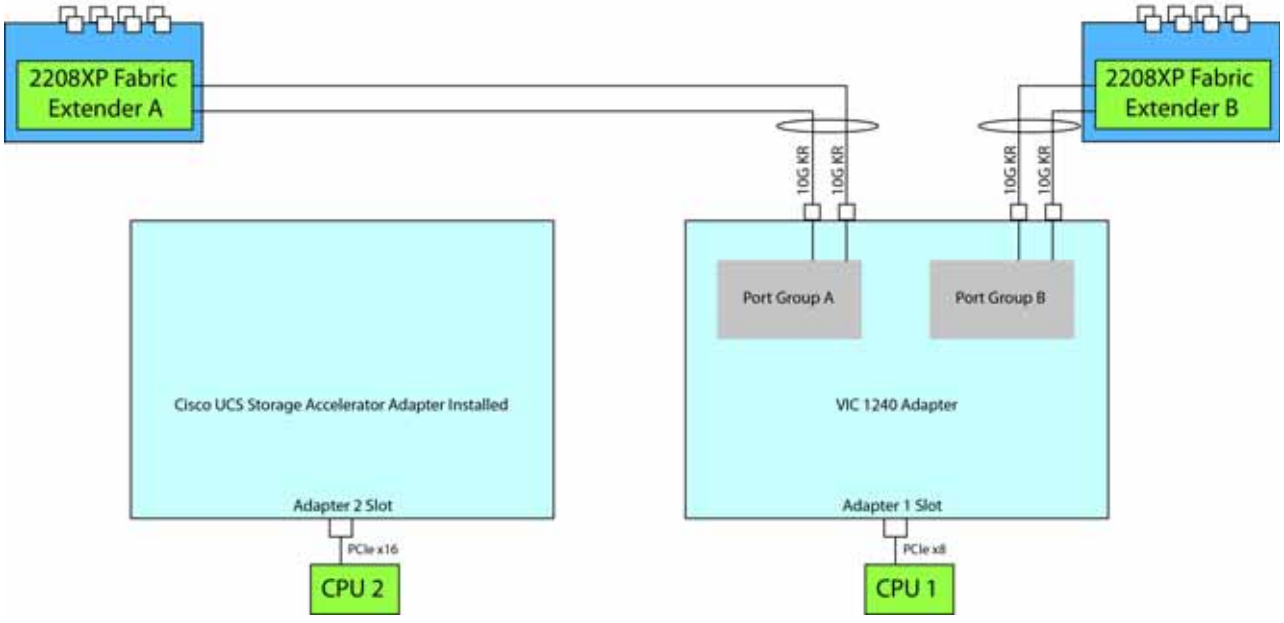
In ***Figure 15***, there is no mezzanine adapter installed. Two ports from the VIC 1240 are channeled to 2208XP Fabric Extender A and two are channeled to 2208XP Fabric Extender B. The result is 20 Gbps of bandwidth to each Fabric Extender.

Figure 15 Option 2 - VIC 1240 to UCS 2208XP Fabric Extender (no mezzanine adapter)



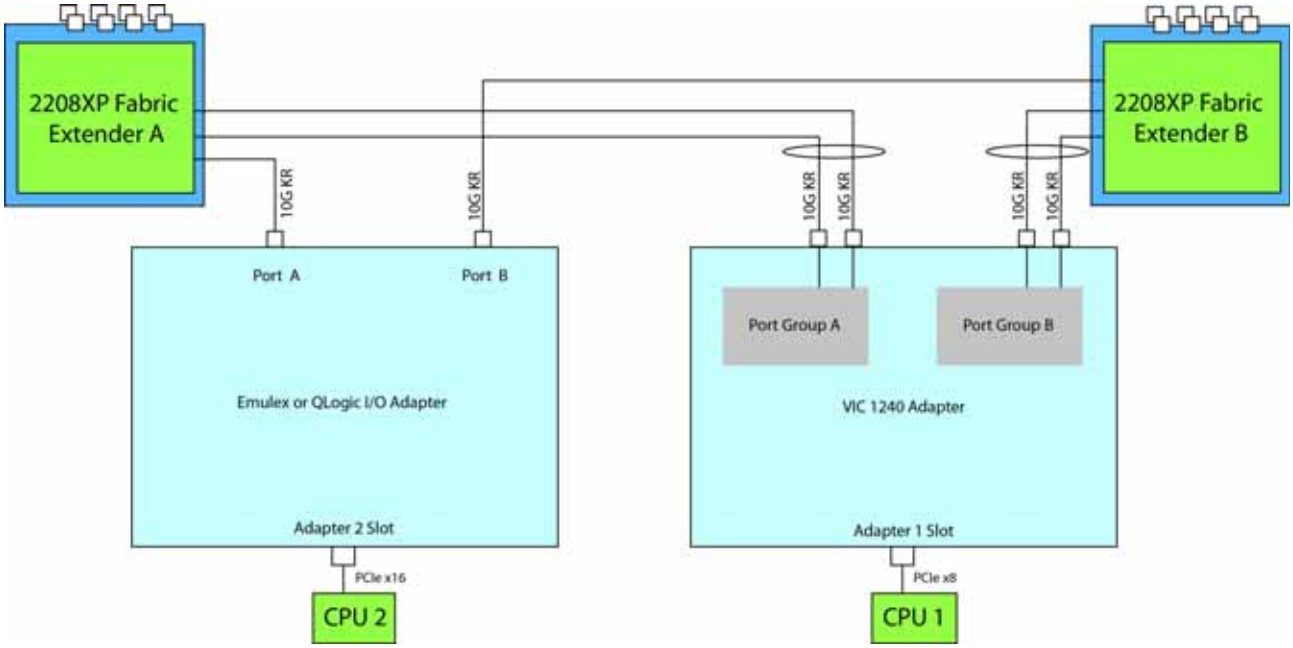
In ***Figure 16***, two ports from the VIC 1240 are channeled to 2208XP Fabric Extender A and two are channeled to 2208XP Fabric Extender B. The result is 20 Gbps of bandwidth to each Fabric Extender. The Cisco UCS Storage Accelerator adapter in the adapter 2 slot has no network connectivity.

Figure 16 Option 3 - VIC 1240 to UCS 2208XP Fabric Extender (with Cisco UCS Storage Accelerator adapter)



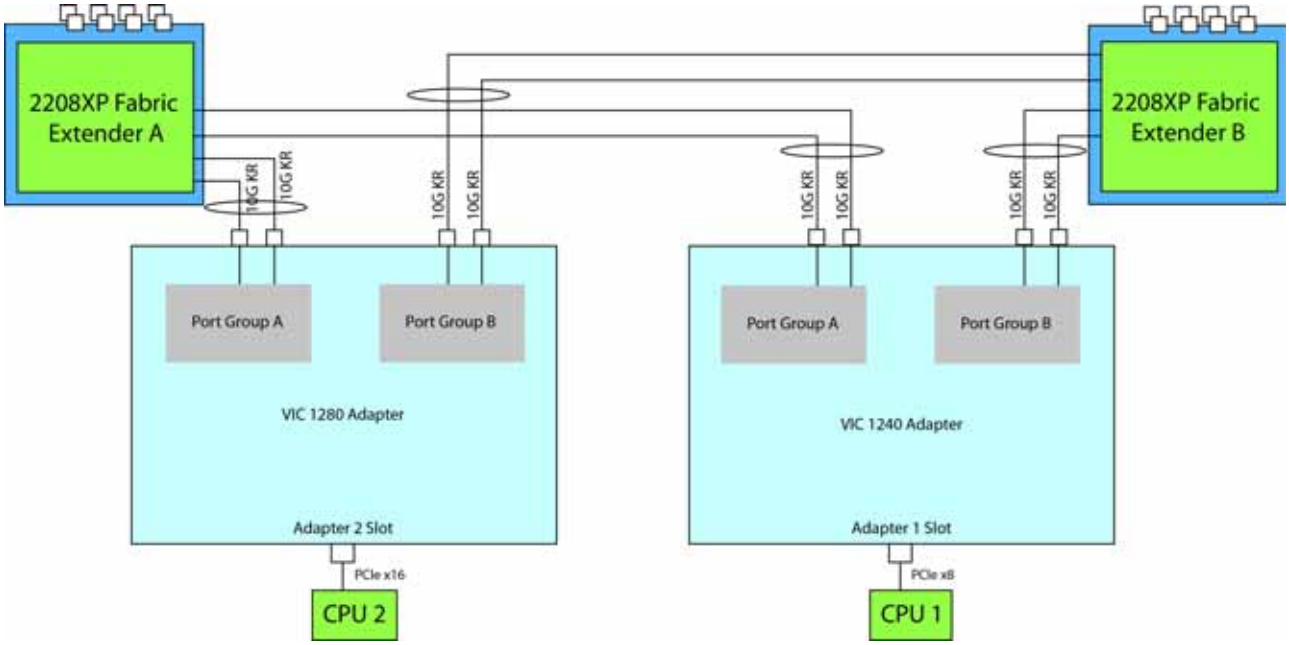
In *Figure 17*, two ports from the VIC 1240 are channeled to 2208XP Fabric Extender A and two are channeled to 2208XP Fabric Extender B. The Emulex or QLogic I/O adapter installed in the adapter 2 slot also channels one port to each of the Fabric Extenders. The result is 30 Gbps of bandwidth to each Fabric Extender.

Figure 17 Option 4 - VIC 1240 and Emulex or QLogic I/O Adapter to UCS 2208XP Fabric Extender



In *Figure 18*, two ports from the VIC 1240 are channeled to 2208XP Fabric Extender A and two are channeled to 2208XP Fabric Extender B. The VIC 1280 installed in the adapter 2 slot also channels two ports to each of the Fabric Extenders. The result is 40 Gbps of bandwidth to each Fabric Extender.

Figure 18 Option 5 - VIC 1240 and VIC 1280 to UCS 2208XP Fabric Extender



Connectivity using the Cisco UCS 2204XP Fabric Extender

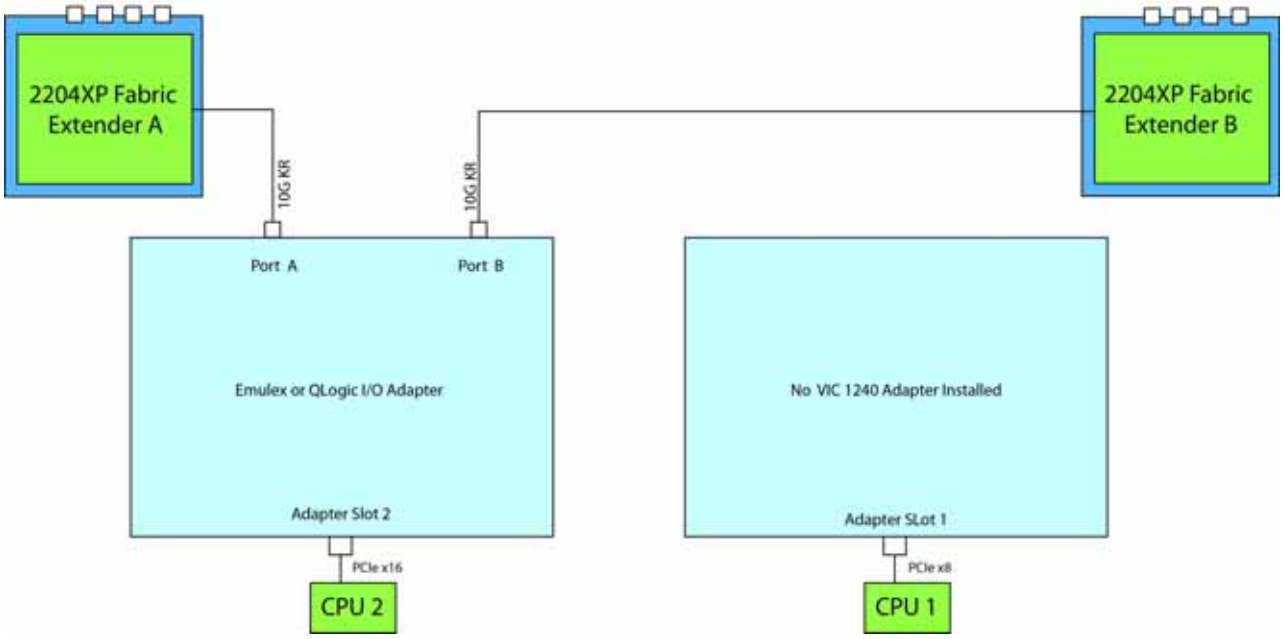
The Cisco UCS 2208XP is a second-generation Fabric Extender, and shares the same form factor as the current UCS 2100 series. The 2204XP is backwards compatible with the UCS 5108 Blade serve chassis.

The options shown in ***Figure 19*** through ***Figure 23*** demonstrate how the server uses these options:

- Emulex or QLogic I/O adapter to 2204XP
- VIC 1240 to 2204XP
- VIC 1240 and Cisco UCS Storage Accelerator adapter to 2204XP
- VIC 1240 and Emulex or QLogic I/O adapter to 2204XP
- VIC 1240 and VIC 1280 to 2204XP

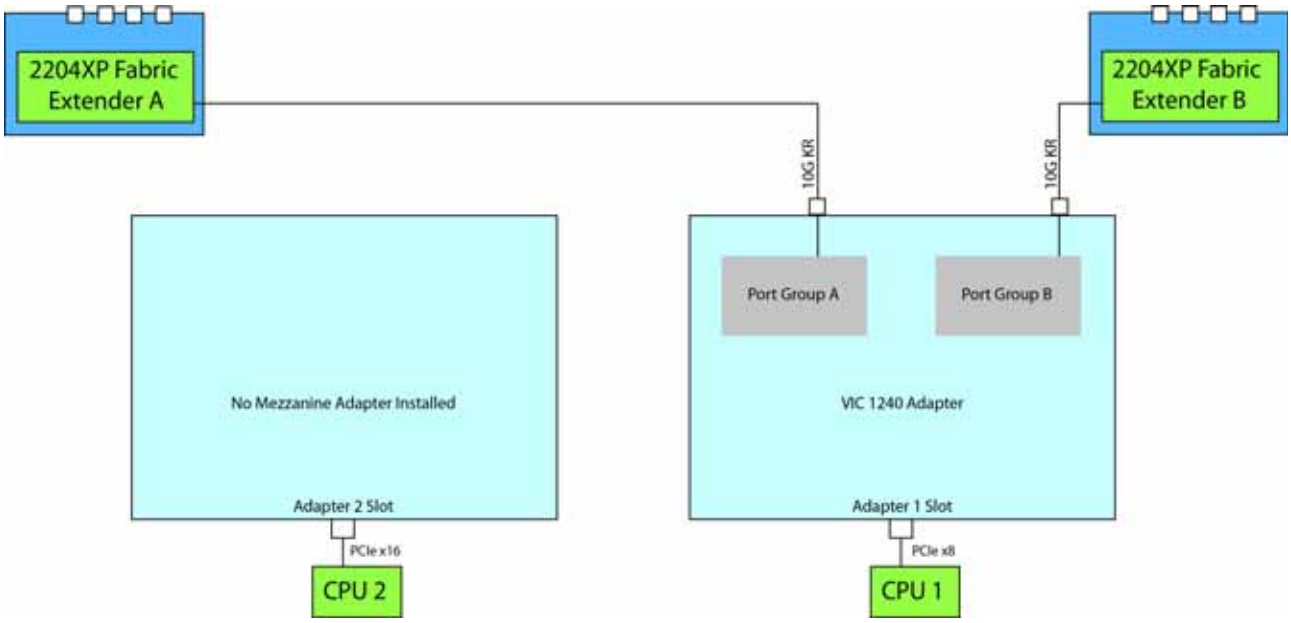
In ***Figure 19***, there is no VIC 1240 adapter installed. In this case, a network adapter must be installed in the adapter 2 slot. Ports A and B of the mezzanine adapter connect to the Fabric Extenders, providing 10 Gbps per port.

Figure 19 Option 1 - Emulex or QLogic I/O Adapter to UCS 2204XP Fabric Extender (no VIC 1240 adapter)



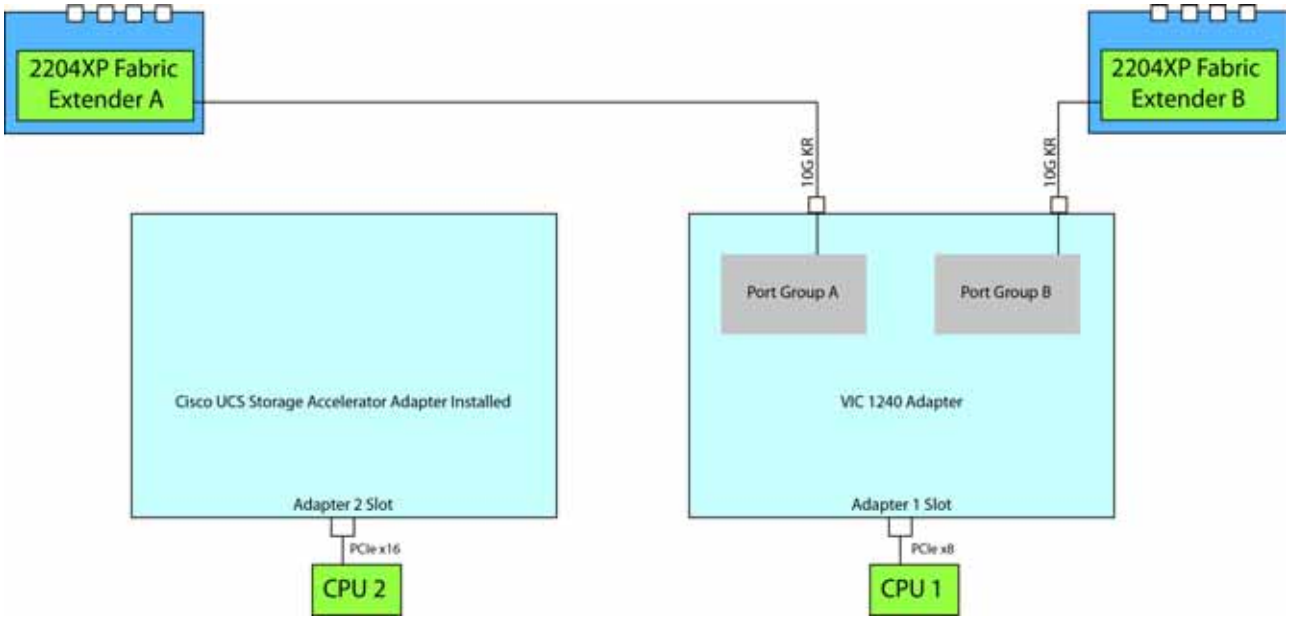
In ***Figure 20***, there is no mezzanine adapter. One port from the VIC 1240 is channeled to 2204XP Fabric Extender A and one is channeled to 2204XP Fabric Extender B. The result is 10 Gbps of bandwidth to each Fabric Extender.

Figure 20 Option 2 - VIC 1240 to UCS 2204XP Fabric Extender (no mezzanine adapter)



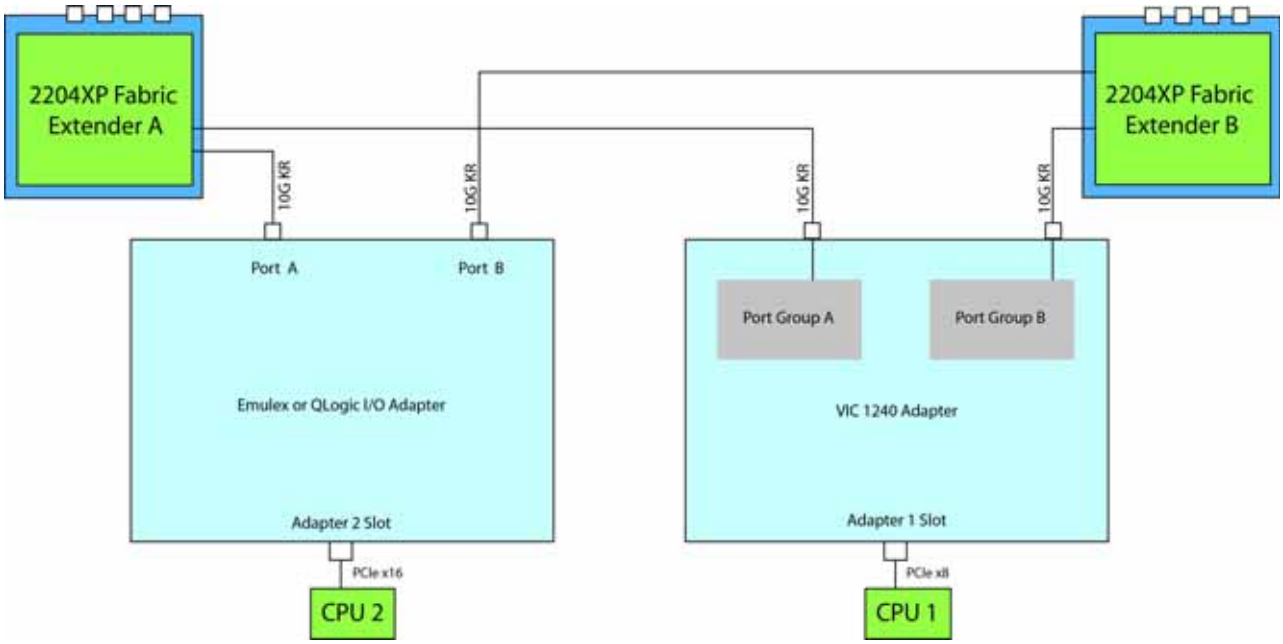
In ***Figure 21***, one port from the VIC 1240 is channeled to 2204XP Fabric Extender A and one is channeled to 2204XP Fabric Extender B. The result is 10 Gbps of bandwidth to each Fabric Extender. The Cisco UCS Storage Accelerator adapter has no network connectivity.

Figure 21 Option 3 - VIC 1240 to UCS 2204XP Fabric Extender (with Cisco UCS Storage Accelerator)



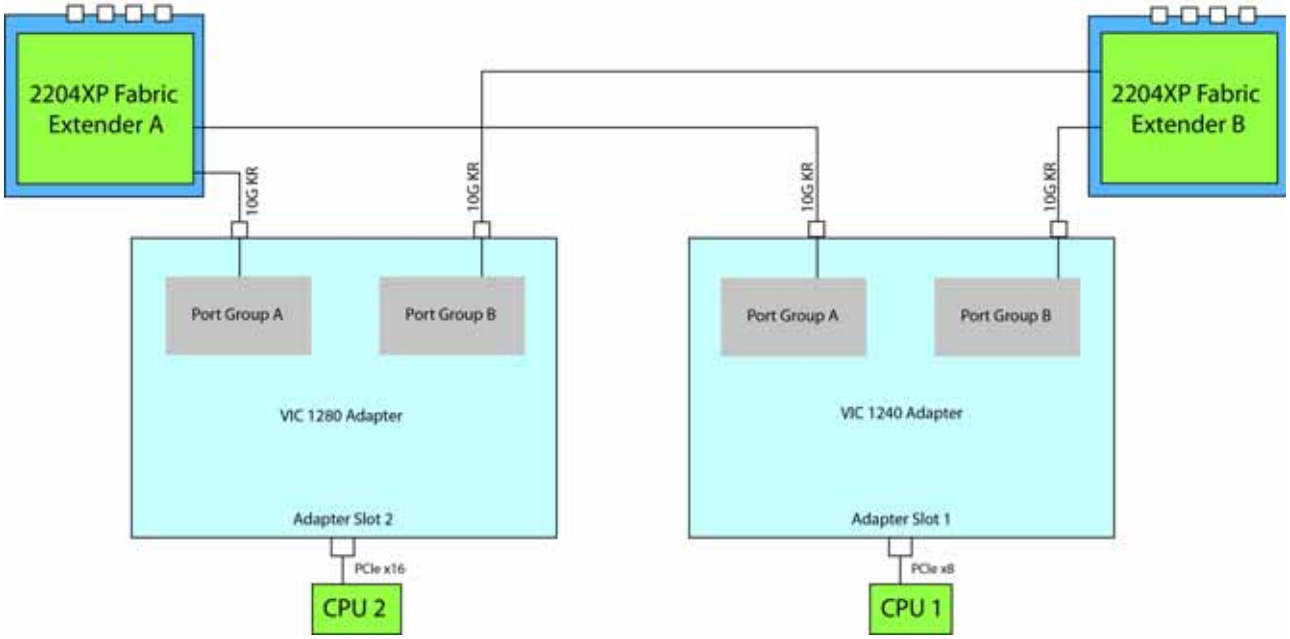
In ***Figure 22***, one port from the VIC 1240 is channeled to 2204XP Fabric Extender A and one is channeled to 2204XP Fabric Extender B. The Emulex or QLogic I/O adapter installed in the adapter 2 slot also channels one port to each of the Fabric Extenders. The result is 20 Gbps of bandwidth to each Fabric Extender.

Figure 22 Option 4 - VIC 1240 and Emulex or QLogic I/O Adapter to UCS 2204XP Fabric Extender



In ***Figure 23***, one port from the VIC 1240 is channeled to 2204XP Fabric Extender A and one is channeled to 2204XP Fabric Extender B. The VIC 1280 installed in the adapter 2 slot also channels one port to each of the Fabric Extenders. The result is 20 Gbps of bandwidth to each Fabric Extender.

Figure 23 Option 5 - VIC 1240 and VIC 1280 to UCS 2204XP Fabric Extender

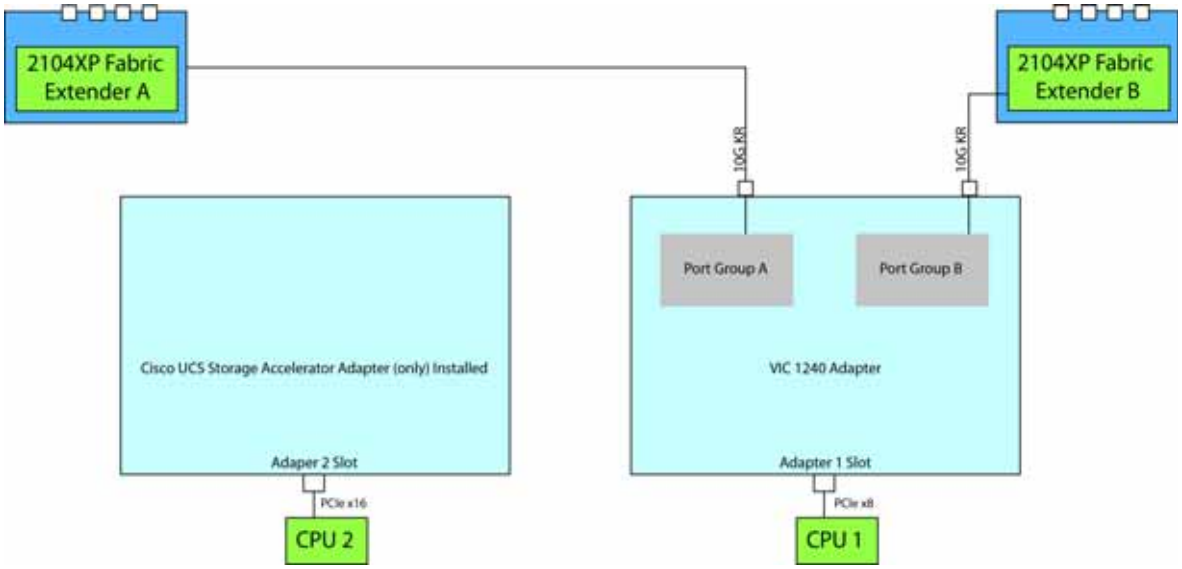


Connectivity using the Cisco UCS 2104XP Fabric Extender

The options shown in ***Figure 24*** and ***Figure 25*** demonstrate how the UCS B22 M3 blade serves connects to a UCS 2104XP Fabric Extender.

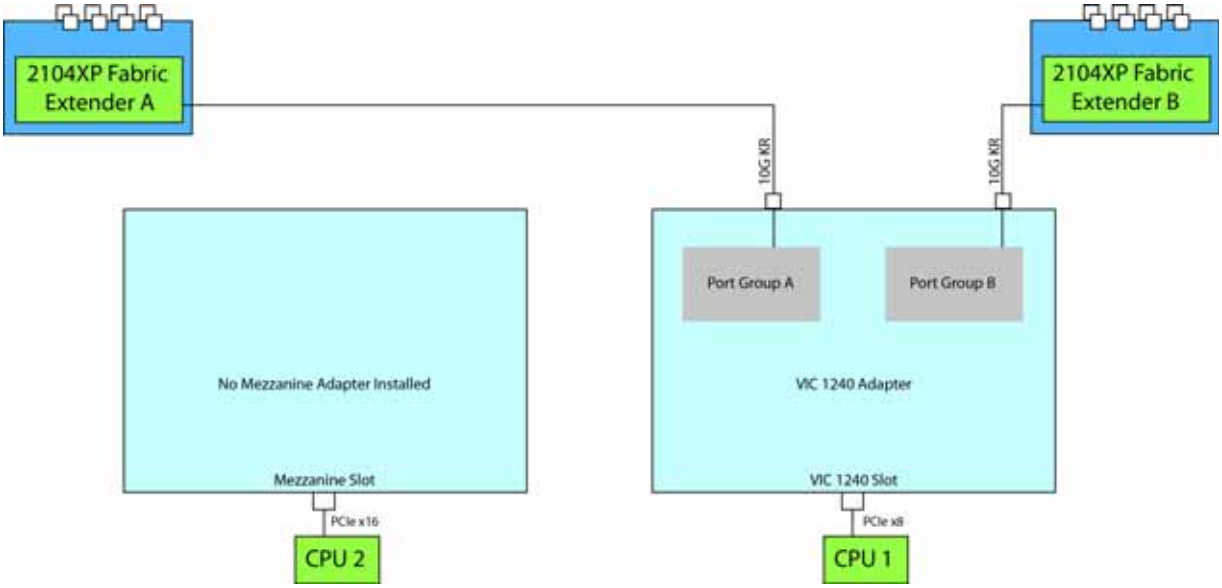
In ***Figure 24***, one port from the VIC 1240 is channeled to 2104XP Fabric Extender A and one is channeled to 2104XP Fabric Extender B. The result is 10 Gbps of bandwidth to each Fabric Extender. The Cisco UCS Storage Accelerator adapter located in the mezzanine connector acts as an independent device controlled by CPU 2 and has no network connectivity.

Figure 24 VIC 1240 to UCS 2104XP Fabric Extender (with Cisco UCS Storage Accelerator adapter)



In ***Figure 25***, one port from the VIC 1240 is channeled to 2104XP Fabric Extender A and one is channeled to 2104XP Fabric Extender B. The result is 10 Gbps of bandwidth to each Fabric Extender. There is no adapter located in the mezzanine connector.

Figure 25 VIC 1240 to UCS 2104XP Fabric Extender (no mezzanine adapter installed)



TECHNICAL SPECIFICATIONS

Dimensions and Weight

Table 26 UCS B22 M3 Dimensions and Weight

Parameter	Value
Height	1.95 in. (50 mm)
Width	8.00 in.(203 mm)
Depth	24.4 in. (620 mm)
Weight	■ Base server weight (no HDDs, no CPUs, no VIC 1240 adapter, no mezzanine adapter, no memory) = 9.62 lbs (4.36 kg) ■ Minimally configured server (1 HDD, 1 CPU, a VIC 1240 adapter but no mezzanine adapters, 1 DIMM module,) = 12.50 lbs (5.67 kg) ■ Fully configured server (2 HDDs, 2 CPUs, VIC 1240 and mezzanine adapters both populated, all memory) = 14.98 lbs (6.79 kg)

Power Specifications

For configuration-specific power specifications, use the Cisco UCS Power Calculator at:

http://ucspowercalc.cisco.com

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Cisco Systems, Inc.
San Jose, CA

Asia Pacific Headquarters
Cisco Systems (USA) Pte. Ltd.
Singapore

Europe Headquarters
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The Netherlands

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